Classroom Behaviour of Pupils

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PREFACE

Education is one of the powerful instruments of Social transformation. The quality and rapidity of the Social transformation, however, depends on the quality of education which, in turn, depends on the quality of instruction. Research support is indispensible for improving effectiveness of teaching. Moreover, research on teaching, therefore, has assumed significance during the latter half of the present century. The classroom learning behaviour of pupils has been perceived as a missing link in reviews of research on teaching. The present study is modest attempt to bridge this gap.

The study has been divided into five Chapters. The first Chapter, Conceptual Framework, provides the context in which the study has been conceived, statement of the problem with specific objectives and hypotheses formulated for testing. The design and procedure of the study constitute the second Chapter. This Chapter also provides the methodology for observation of classroom teaching and the statistical techniques followed for processing data in accordance with objectives of the study. Chapter three provides correlational and prediction results relating to pupil classroom learning behaviour, pupil out-of-school achievement related efforts, teacher behaviour and pupils' achievement. The Chapter to follow provides comparative profiles of classroom learning behaviour of pupils belonging to high and low socio-economic status. It also provides results emerging from testing the hypotheses using the inferential statistics. The last Chapter summarises findings and presents implications of the study for future research.

Several persons and institutions have played vital role in completing the present study. At the outset, my sincere thanks are due to my supervisor, Dr. A.K. Gupta, Head of the Faculty of Education, J.V. Jain College, Saharanpur, who gave constant guidance, encouragement and moral support during the period of my study. I feel highly indebted to him for supervision and guidance.

I am immensely indebted to Dr. N.K. Jangira, Professor, Department of Teacher Education, N.C.E.R.T., who inducted me to the area of classroom research and whose seasoned guidance and sustained encouragement had been a source of inspiration to me throughout. His scholarship and expertise in the area of Teacher Education on the one hand and the significant experience of research on teacher effectiveness on the other hand, provided me not only insight in the area of present research but also a quest to do more and better. I drew inspirations from his constructive advice and willingness to give unstingly of his time during all phases of the study. Without his supervision, help and co-operation it could not have been possible for me to complete the study.

Lastly, I owe my gratitude to my parents and my wife Smt. Santosh Yadav whose patience and assistance confirmed the culmination of the present study. My sons Vinay and Vivek made my work easier through their smiles.

MAHABIR YADAV

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1

THE CONCEPTUAL FRAMEWORK

Core Questions

Modern civilizations are in a state of flux, India being no exception to it. The statement reflects truism because of the rapidity of the changes visiting societies. There was a time when generations lived a lifestyle with an imperceptible change coming to the level of practically no change for generations together. Today during a life time human beings live several generations due to the accelerated pace of change ushered in by advances in science and technology. The fact been aptly brought out in recent publication.

> There was a time when civilizations creeped. Gradually civilizations learnt to walk. Later nineteenth and early twentieth centuries witnessed them racing. The second half of the present century shot them into space. What a pace of advancement! The advancing frontiers of science and technology in recent years have influenced life of the people in several ways. The search for resources on other planets as well as under the seabeds is on. The discovery of these resources and their possible mobilisation for meeting the basic human needs promise a better future for mankind. The application of science and technology has shown a promise to wipe out disease and hunger from the

> planet called Earth. Green and white revolutions alongwith expanding health services are pointers to this end. The revolutionised transport and communication modes have practically annihilated time and distance. The increased mobility of men and material and flash of ideas across the globe through mass media have dismantled national barriers. Increased interdependence among countries is the inevitable outcome (Jangira, 1984).

Indian society is also undergoing changes of far reaching consequence. Conscious of the emerging trends in socio-economic development of the country and anticipating future orientation of the Indian Society, the Indian Education Commission (1964-66) considered education as a major instrument for bringing about socio-economic changes in the country with a view to modernising the Indian Society. The Education Commission's view is adequately reflected in the statement ``destiny of India is now being shaped in her classrooms''. There is no doubt that the destiny is going to depend on what exactly happens in the classrooms and how it happens. What do the teachers do? How do they carry out classroom transactions? What are the instructional resources available and how do they make use of them? Yet another related question is whether there are some ways which can be suggested to the teachers to exhibit teacher behaviour patterns to generate the desired level of learning in pupils. Can we provide guidelines to teachers about the effective classroom learning behaviour of pupils so that they can encourage pupils to develop such answers to other related questions. For example, do pupils differ in their classroom learning behaviours? If so, do they differ in their achievements? What pupil and teacher behaviours count for their need focus of attention to seek reasonable answers, if planned learning goals are to be realised. In other words, answers to these questions will provide useful guidelines for making teaching effective.

Search for a Research Base for Teaching

Man is a social animal and from its very inception has a tendency to convey his ideas and knowledge to others in the group in which he lives. That is the only reason that this species has not only survived but has accelerated progressive tendencies over the years. The process of conveying the experience of learnt ideas is one of the core objectives of teaching. Earlier when sciences were not so developed, philosophers' views and what they said about the related subjects determined teaching methodology (Broudy, 1962). With the development of psychology in general, and learning psychology in particular, the concept of teaching underwent a change. In other words, these developments influenced teaching (Mitra, 1972). These approaches, however, have been found to be inadequate. The increased awareness of the professionals about these inadequacies led to analytic approach for operationalising teaching in terms of teacher behaviours. Teacher behaviour approach to the conceptualisation of teaching and search for effective teacher behaviours became the quest for teacher effectiveness. The increasing demand for accountability has further necessitated more and more research in this area so as to optimise pupil learning in relation to the resources expanded in teaching.

Early Research Efforts

The demand for accountability in teaching and search for effective teacher resulted into an unprecedented expansion of research in this area during the present century. It is evident that literally thousands of studies were conducted on teacher excellence since the beginning of the twentieth century, but findings were inconclusive and piecemeal. The studies failed to present a profile of competent teachers.

In the beginning of the present century, teacher effectiveness studies started firstly asking the pupils for listing characteristics of the best teachers (Hart, 1936). Opinions of the educational experts were also sought about effective teachers. The outcome was a list of qualities of teachers. The implicit assumption underlying these studies was that good teachers are born and not made.

Later rating scales were used to find traits of effective teachers. In 1930, Barr collected 209 different rating each of which was being used to evaluate teachers or student teachers (Barr, 1930). On validating these rating scales, no correlation between rating of effectiveness and measures of effectiveness was found. A number of additional attempts to validate ratings of teacher effectiveness appeared during the subsequent two decades (Medley & Mitzel, 1959). The results were almost the same in every study. The implications drawn from the decisions about teacher effectiveness on such ratings were disturbing.

Barr(1948) attempted to establish relationship between teacher characteristics and student achievement. This generated a lot of research in the first half of the present century. The results, however, were not encouraging as revealed in a number of research reviews. Morsh and Wilder (1954) who reviewed research that were undertaken during the period 1900-52 concluded that ``no single, specific, observable teacher act has yet been found whose frequency or percentage of occurance has invariably and significantly correlated with student achievement''. The equivocality of research findings was futher demonstrated by Anderson (1959), Medley and Mitzel (1963), Howsam (1960) who argued that much work on teacher effectiveness must be described as irrelevant because it lacked criteria and objective measures.

A Step Forward

It was felt that the teaching process which did not receive the desired focus in the research on teacher effectiveness could be helpful in identifying effective teacher behaviours. Hundreds of studies were carried out on the problem of teacher effectiveness in 1960's taking into account the classroom behaviour of teachers which was earlier neglected. Researchers began to move away from rating scales which usually require relatively subjective observation schedules. Tools with low inference categories of teacher behaviour started to be used. The tools are known as `low inference' measures because they focus upon specific, objectively descrbable behaviours such as `teacher asks for pupil ideas' or `teacher criticises/praises pupils'. These behaviours were recorded as frequency counts. Flander's Interaction Analysis Categories System (FIACS) became the forerunner of such tools. It is one of the most used tools in studies in teaching during the sixties. His contribution appears to be the approach to record and analyse teacher behaviour detailed in Flanders (1970). This generated process research in teaching producing a new generation of research.

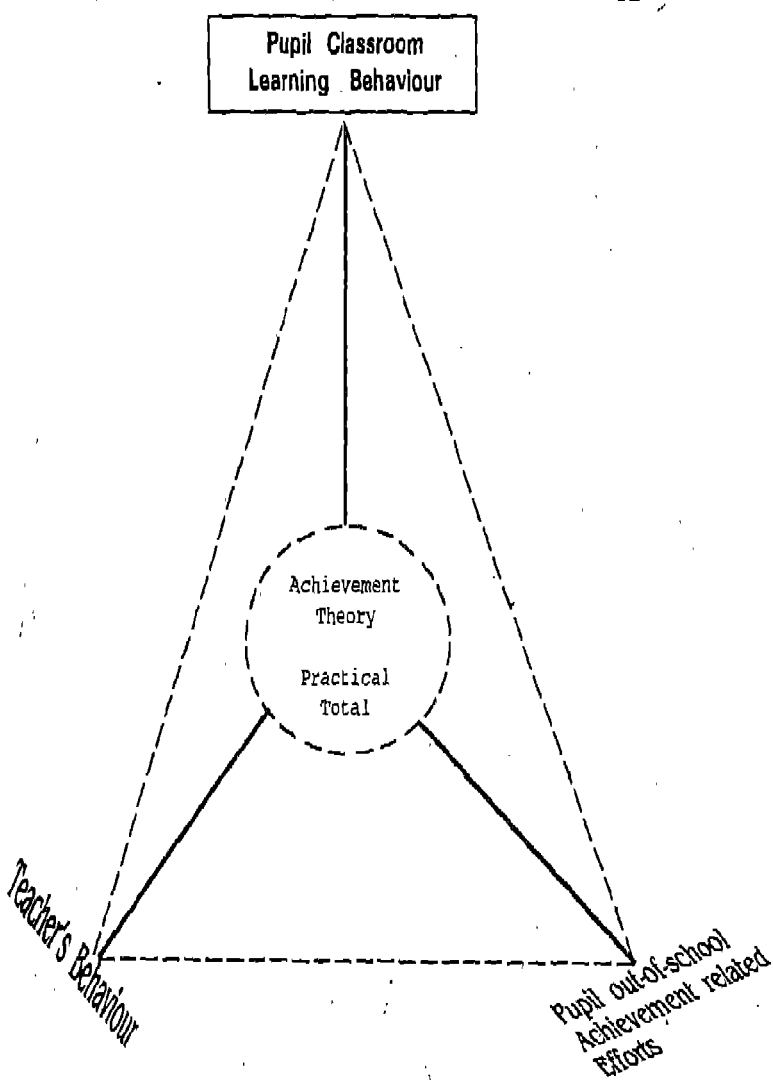
The teaching and teacher effectiveness were again analysed keeping in view the impact of teacher behaviour relationship with pupils' outcome. Initially the results were encouraging over the previous reviews as five desirable teacher behaviours, namely, warmth, cognitive organisation, orderliness, indirectness and problem solving showed optimistic results (Gage, 1965). Amidon and Simon(1965) reviewed studies on teacher-pupil interaction and the tools used for its measurement. The reviewers concluded that there were definite patterns of teacher-pupil interaction in the classroom; that these interaction patterns could be objectively measured and characterised; that achievement perception and classroom climate were apparently related, and that the relationship between teacher personality and teacher behaviour was uncertain. Flanders and Simon

(1969) reviewing researches on teacher effectiveness from 1960 to 1966 expressed cautious optimism marshalling a number of studies showing significant positive relationship between teachers' acceptance and use of ideas and opinions expressed by pupils, on the one hand, and pupil achievement, attitude and other variables on the other. With growing research on teacher behaviour the results started becoming blurred. Rosenshine also had to revise his optimism on such researches (Rosenshine, 1971; Dunkin and Biddle, 1974).

Out of the research on teacher characteristics, classroom behaviour and pupil outcomes during the sixties emerged a conceptual framework for research on teaching. Biddles' seven variable model of 1964 was further rationalised in Dunkin and Biddle (1974). The framework was developed for a comprehensive review of research on teaching. The emerging model has been presented in figure 1.1.

The conceptual frame for research on teaching depicted in the figure encompasses five sets of variables, namely, presage, context, process, process-process and product variables. The presage variables relate to the characteristics of teachers like their formative experiences that is, social class, age and sex; and their cognitive and affective properties like their training, experience, personality traits and teaching skills; Context variables relate to the conditions to which the teacher has to adjust, the characteristics of the school, classroom and pupil, school characteristics including climate, community size, ethnic composition of the community and bussing school size. Classroom characteristics include the class size, textbooks, educational hardware, etc., while pupil characteristics include the pupils' social class, age, sex, ability, attitude and knowledge. Besides this, the subject characteristics are also covered. Process variables concern actual activities of classroom teaching, teacher and pupils behaviour, while process-process variables deal with interactive behaviours of teacher-pupil behaviours. Finally, product

Fig. 1.1 Corelational Dynamics of Variables involved in the Study



variables concern the outcome of teaching, the changes that occur in pupils as a result of their involvement in classroom activities. The term `pupil growth' or `pupil change' can relate to cognitive, effective and psychomotor characteristics.

Mitzel argued that the best to hope for improving research on teaching is the study of process variables, and this appears to have been largely accepted by most researchers in this area. So, it has been emphasised that measures of pupil growth constitute the ultimate criteria for research on teaching effects (Rosenshine and Furst, 1973). The process-product researches provided consistent results in the sixties.

A Setback

As research on teaching employing low inference variables multiplied, the inconsistencies started appearing. The optimism of the sixties started receding in the seventies. Jangira (1979) pointed out this inconsistency in the Indian studies, Gage (1972), Soar (1972) and Rosenshine (1976) revealed this concern in respect of research abroad. The major drawback identified in these studies was that they did not take into account the pupil behaviour in the manner it should have been done. For example, pupils attention, academic learning time and on task and off task behaviours on which the pupil outcome depended were not covered adequately (Rosenshine, 1976). So, as a corrective measure, another generation of research on effective teaching made an appearance towards the end of seventies spilling over to eighties.

New Focus

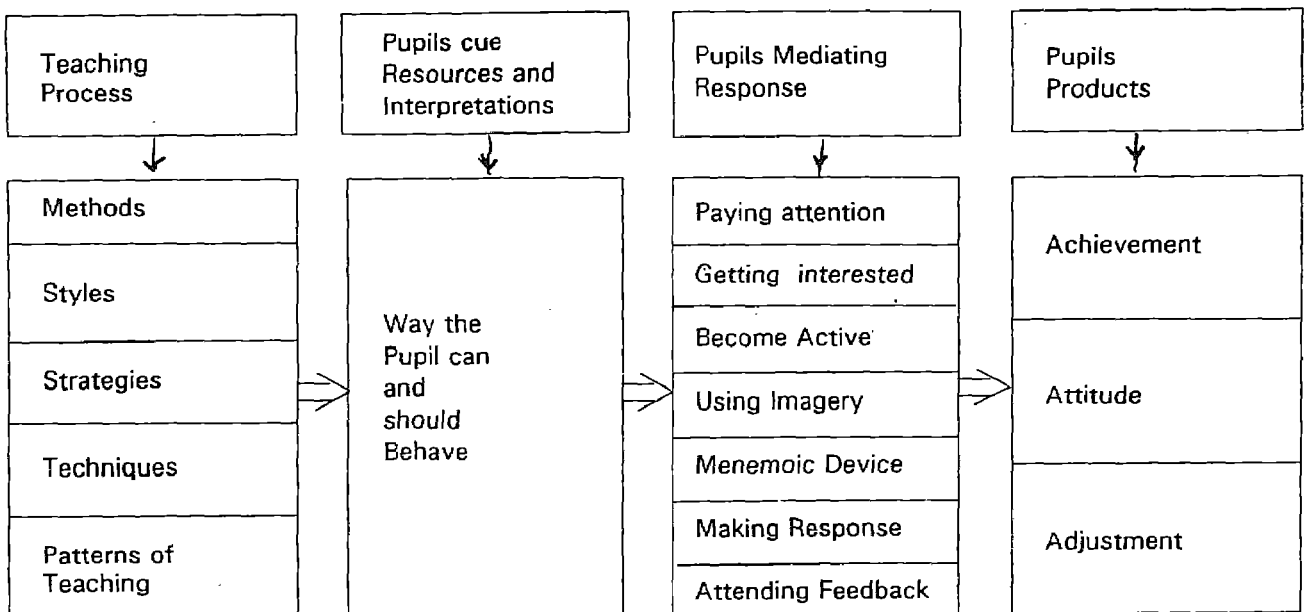
The Setback to research on teaching employing low inference variables in the seventies led to fresh thinking on the approach to future research in this area. Two developments made a significant contribution to conceptualise the new generation of research. The development of school learning

model by Bloom (1976) based on the Carroll's Model (1963) laid emphasis on the research focused on the learner and the learning time. Further, Doyle's expansion of the process-product area of research in conceptual frame provided by Dunkin and Biddle (1974) envisaged microview of the pupils behaviour. The expanded version of the process are classroom teaching transaction envisaged in Doyle's Model is given in Fig. 1.2.

The Doyle's expanded process-product model covers four variables sets. Process variable is comprised of teacher behaviour that constitute methods, styles, strategies, techniques and patterns of teaching. These teacher behaviours will provide pupils with cue concerning the ways in which pupils can and should behave if they have to achieve good grade. After the pupils have perceived and interpreted these cues, they will (with the teacher's help exhibit the mediating responses such as paying attention, getting interested, becoming active, using imagery and menemoic devices, engaging in self-recitation, making responses and attending to feedback. Finally, these students mediating responses will result in the products-the kind of achievement and attitudes that sets the objectives of classroom transactions. Finally, it suggests that we also look at the way these pupil behaviours serve as the most immediate anticipator and perhaps determiners of the products, namely, pupil achievement and attitude.

Recent researches on teaching have focussed more on student variables and the proportion of student time spent in working outside the instructional hours and in verbal interaction as a part of classroom transactions (Rosenshine, 1982; Mitzel, 1982). Following Academic Learning Time Model, a series of studies as a part of the major product entitled ``Beginning Teacher Evaluation Study'' emerged in the latter part of 70's and early 80's (Fisher, Filby, Marliave, Cahen, Dishaw, Moore and Berliner, 1978; Dehan and Lieberman, 1980). The contribution of this generation of research has been well summarised in the Scientific Bases of the Art of the teaching (Gage,1978).

Figure: 1.2 **CONCEPT FRAME OF ELABORATED PROCESS-PRODUCT MODEL OF TEACHING : DOYLE'S MODEL**



Although this type of studies have also met with criticism (Gage,1978; Stalling, 1980; Frymier, 1981;McNamara,1981),but they have provided good variables for research on teaching.

The current reviews of research on teaching have revealed the missing focus on pupil learning behaviour (Medley, 1971; McDonald, 1975; Brophy, 1976; Rosenshine, 1978; Bropny, 1980; Jangira, 1980; Mitzel, 1982).

Some of the non-academic activities like Art and Craft and asking pupils open ended questions about their personal feelings and opinions also contribute towards academic gain during classroom teaching-learning processes (Rosenshine, 1982). It makes it imperative for the researchers to concentrate on pupil classroom learning behaviour which should be searched for all its multifarious varying effects with other teacher and pupil variables. There is need to carry out research in this vital area of teaching.

Attempts at Prediction of Achievement

The pupils classroom characteristics indicating positive relationship with achievement are a variety of instructional material (McDonald, 1976), positive feedback (Bloom, 1976; McDonald, 1976), a less competitive atmosphere (Talmadge & Welberg, 1978) more attention to individual differences (McDonald, 1976; Rosenshine, 1979), an appropriate level of difficulty (Chall & Feldmann, 1968). Studies (Menon, 1973; Anand, 1973; Dewal, 1973; Abraham, 1973; Basavayya, 1974; Chandra, 1975) showed that the home environment, parental occupation and education and socio-economic status affected the pupils' achievement while Jha(1970) and Sudame(1973) found no significant correlations between SES and academic achievement. School based home instructional learning as reviewed by Thomas and Herbert (1983) from 29 controlled studies, found in standard reference for the period 1970 through 1980, were statistically synthesized and related

to 43 characteristics of the school such as, treatment condition design features and types of students. The results were encouraging as the mean effect corresponds to the 76th percentile, and the range is from the 21st to 99th percentile. The relative sizes of the effects are attributable to study methodologies such as, reliability of treatment implementation as well as programme features such as length of intervention.

Secondly, allocated time or opportunity learn is dealt within the classroom context where teacher can lay emphasis on the proper use of time and how they allocate time to particular segment of the curriculum and likely cumulative effect on students' opportunity to learn.

The research on instructional time has begun to underscore the importance not only of temporary aspects of the tasks being attended to. By highlighting this often neglected aspect research has begun to attend to the issue of appropriateness and meaningfulness of learning experiences for children. While the research knowledge to day is slight, we do know that a high level of success is an important variable in learning (Fisher et al , 1980), particularly for low-ability elementary students.

Another area refers to out of school time and type of activities performed by pupils which is likely to influence his achievement. Studies on home environment process began with the work of Dave (1963) and Wolf (1964, 1966) and have since been replicated in other studies like Marjorbanks(1974); Kalinwski and Sloane (1980). The areas covered in these studies are work habits of pupils at home, academic guidance and support, stimulation and academic aspirations, while the way of improving these for improved achievement gains has been dealt in the study conducted in Thailand by Janhom (1983). The effective use of time available at home and tutoring resulted in sizable effect on children's school achievement (Iverson and Walberg, 1979). The studies have implications for research. It would be worthwhile to identify the out-of-school activities which should receive attention in research on teaching (Coulter, 1979).

The present synthesis concludes that school-based home instruction programmes are consistantly favourable and have, on the average, large effects on children's academic learning. More valid research designs and tests that reflect the specific intensions of the programmes and experiences of the children in them show large effects. Future researches might well focus on whether these can be emphasized more effectively for better pupil gains.

Survey of research in education in India (Buch, 1974, 1979 and in press) reveal that this generation of research on teaching are conspicuous by their absence. Most of the researches on teaching and teacher behaviour reported in these surveys are based on Flander's work. These types of studies are much needed in the Indian context. These studies should associate pupils classroom learning behaviour and out of the school achievement related activities with pupil achievement. Once correlational studies are able to generate plausible hypotheses relating different sets of variables, experimental studies to determine cause-effect relationship could then be planned and carried out. The present study is an attempt in this direction.

State of the Problem

The preceding section provides conceptual framework for research on teaching. It was also pointed out that there is the need to take-up studies with focus on classroom learning behaviour of pupils. Some pertinent questions which need to be answered by such researches are whether different types of pupils exhibit different classroom learning behaviours? How are these variables related to pupil achievement? Is pupil's out-of-the school effort related to pupil achievement? If so, what activities can be selected for the study? What type of variables can be generated in the areas of pupil learning behaviour? Can pupils' classroom learning behaviour and pupils' out-of the school achievement related efforts predict pupils' achievement? How is teacher behaviour related to pupil classroom learning behaviour and pupil achievement? The problem selected for the present study is focussed on such questions.

Problem Statement

The problem was stated as :

CLASSROOM LEARNING BEHAVIOUR OF PUPILS OF DIFFERENT SOCIO-ECONOMIC STRATA AND THEIR ACHIEVEMENT IN SCIENCE

It is evident from the statement that the study is to be conducted on pupils with high and low socio-economic status. It provides the base for the comparative study of different variables. The study further involves a set of twenty five classroom learning behaviour of pupils classified into seven areas as shown in Fig. 1.3. The variables relating to pupil out-of-school achievement related efforts are in terms of the time devoted on studies as the total time which can be further divided into three areas, that is, curriculum related activities, co-curricular activities and curricular free activities. Each areas is sub-divided into ten categories which have been recorded in terms of time on a working day, a holiday and a vacation day. The achievement has been considered for theory and practicals separately. For the purpose of prediction, pupil achievement in science theory, practical and total score constitute criterion variable while .pupil classroom learning behaviours, out-of-school achievement related efforts and allied teacher behaviour having thirteen categories of specific behaviours grouped in five areas as shown in Fig. 1.4. The study is confined to the pupils of grade X of Ajmer city in Rajasthan.

The factors of socio-economic status of pupils and their intelligence, the grade covered and subject area of science constitute context variable. Pupil classroom learning behaviour and teacher behaviour constitute process variables. The pupil achievement in science constitute the product variable. Placing the variable included in the study in the model of teaching presented in the conceptual frame in the preceding section (Fig. 1.1) can be reconstructed as in Fig. 1.5.

Doyle's model envisages four main variables, that is, context, presage, process and product. Under the context variable the pupil properties are covered while presage variable relate to the classroom behaviour of teacher, that is, explanation, questioning, helping pupils, supervision of seatwork and management. The process variable includes pupils perception with which the impact of teacher behaviour leads to pupils cue resources and interpretation-the ways pupils can and should behave. These cues lead to pupil mediating responses which cater to paying attention, getting interested, becoming active, engaging in self recitation and making response. These mediating responses of pupils result into pupil classroom learning behaviour. The pupil classroom learning behaviour, if studied, are categorised as pupil attention, pupil response, soliciting teachers help, pupil-pupil interaction, doing seatwork, helping teacher and involved in managerial activities. The pupil behaviour leads the pupil to product variable, that is, pupil outcome which includes their achievement, attitude and adjustment.

The expanded process-product model implies that it is desirable to look most immediately at the effects of teacher behaviour on the cues given and how the students concerned should behave. It also implies that the effects of these cues on pupils behaviour may be studied. Finally, it suggests that we should look at the way these pupil behaviours serve as the most immediate anticipators and perhaps determiners of the products, namely, pupil achievement and attitude.

Definition of Terms

Several terms have been used in the statement of the problem. It will be worthwhile to define them operationally for the purpose of the present study.

Pupil classroom learning behaviour (PCLB) : The term includes total verbal and non-verbal behaviour of pupil in the classroom transactions in the process of learning from teacher instruction.

Figure: 1.4 **TEACHER BEHAVIOUR VARIABLE**

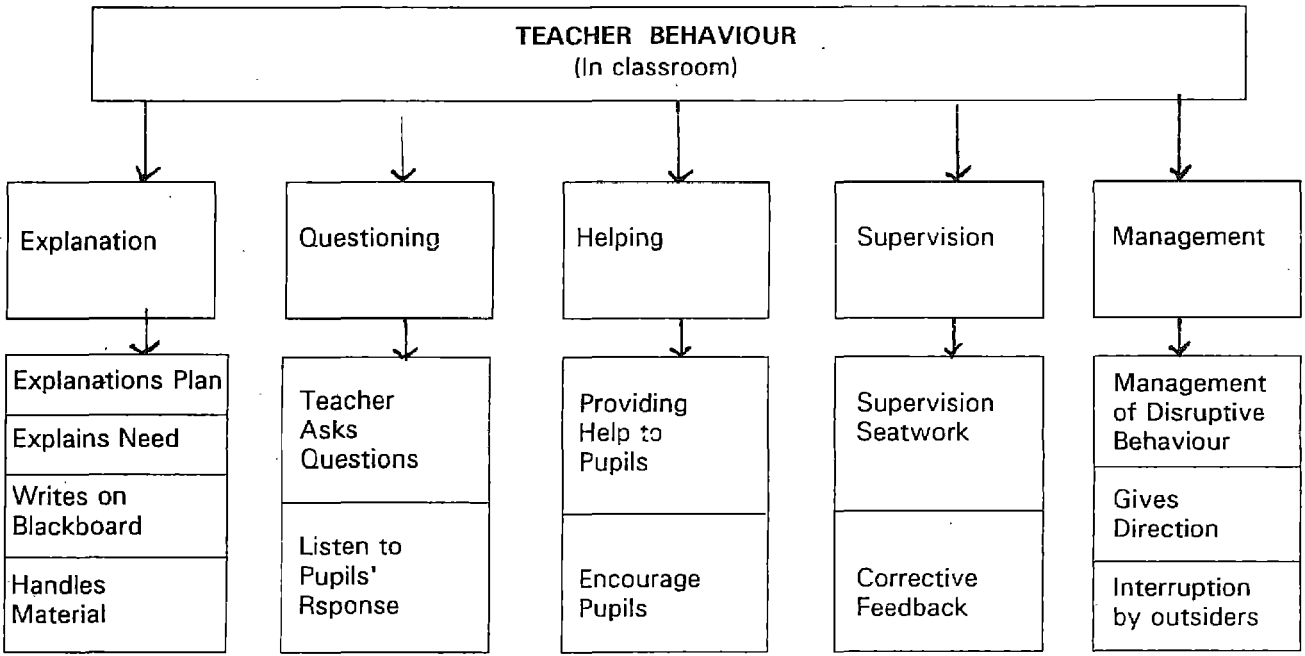
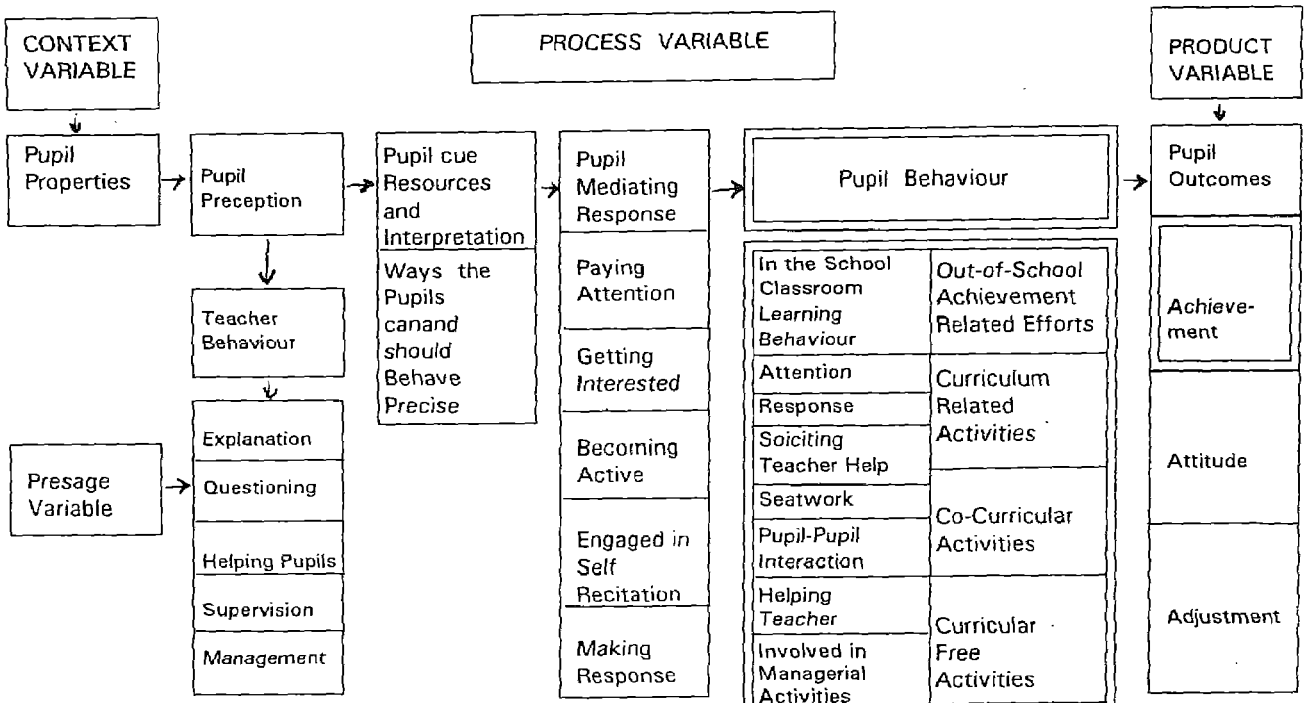


Figure : 1.5 CONCEPTUAL FRAME OF EXPANDED PROCESS-PRODUCT MODEL OF TEACHING



Socio-economic status (SES) : The high and low socio-economic status (SES) are the belonging of the individual in society in terms of the family income, social dealings, status or standard of living, the social recognition, type of profession, possession of luxury items and wealth, and their views about social systems. The SES has been operationalised for the study in terms of the areas mentioned above by Kapoor Socio-economic Status Scale (SESS).

Teacher Behaviour (TB) : Teacher classroom behaviour includes all the verbal and non-verbal behaviour during classroom transactions by the teacher.

Pupil out-of-school Achievement Related Efforts (POSARE) : It includes the time devoted by the pupil while out of the regular school classes or at home for curricular and non-curricular studies. It includes the time devoted like total time devoted on three types of days, that is, on a working day, a holiday and a vacation day. The break-up of the total time of all the three types of days are sub-divided into catergories like library study time, home task time, curricular study time, non-curricular studies time, and newspaper and magazine reading time, help received from parents or tutors or both, teaching aid preparation time, co-curricular activity time and time devoted on hobbies.

Achievement: There are several way to measure pupil achievement. In the present study score of an individual pupil in the annual examination conducted by Rajasthan Board of Secondary Education for the session 1981-82 has been taken as an indicator of pupil achievement in science subject (chemistry): theory, practical and their marks have been considered separately.

Variables Involved: The present study is basically correlational. It also involves prediction of pupil achievement from sets of context and process variable. In prediction of pupil achievement in chemistry theory, practical and total constitute dependent

variables while pupil classroom learning behaviour, teacher behaviour, pupil out of school achievement related efforts and the pupil characteristics like intelligence constitute independent or predictor variables.

Objectives: The study purports to realise the following specific objectives which have been spelt out area-wise:

Pupil Classroom Learning behaviour and Achievement

1. To study the relationship between pupil attention behaviour, namely (a) listening attentively, (b) looking fatigued, (c) looking distracted, (d) involved in disruptive behaviour, and achievement of pupils belonging to high and low SES.

2. To study the relationship between pupil response behaviour, namely, (a) volunteer response, (b)volunteer ideas, (c) does not respond; and achievement of pupils belonging to high and low SES.

3. To study the relationship between pupil seatwork, namely, (a) reading book attentively, (b) pretending to read the book, (c) involved in writing, (d) copying from black board, (b) evading seatwork; and achievement of pupils belonging to high and low SES.

4. To study the relationship between pupil soliciting teacher help, namely, (a) reaches teacher for removing difficulties, (b) reaches teacher for help to complete seatwork, (c) reaches teacher for clarifying doubts, (d) reaches teacher for management of disruptive behaviour of peers, (e) waits for teacher help; and achievement of pupils belonging to high and low SES.

5. To study the relationship between pupil-pupil interaction, namely, (a) discussing a point, (b) giving help, (c) accepting help, (d) responding to pupil questions; and achievement of pupils belonging to high and low SES.

6. To study the relationship between pupil helping teacher behaviour, namely, (a) in handling of material, (b) on the black board; and achievement of pupils belonging to high and low SES.

7. To study the relationship between pupils involvement in classroom managerial activities, namely, (a) teacher directed activity, (b) self-directed activity; and achievement of pupils belonging to high and low SES.

Pupil Out-of School Achievement Related Efforts and Achievement

8. To study the relationship between pupil out-of-school achievement related (POSAR) study total time devoted and achievement of pupils belonging to high and low SES.

9. To study the relationship between POSAR library study time and achievement of pupils belonging to high and low SES.

10. To study the relationship between POSAR home task time and achievement of pupils belonging to high and low SES.

11. To study the relationship between POSAR curricular study time and achievement of pupils belonging to high and low SES.

12. To study the relationship between POSAR non-curricular study time and achievement of pupils belonging to high and low SES.

13. To study the relationship between POSAR newspaper and magazine study time and achievement of pupils belonging to high and low SES.

14. To study the relationship between POSAR help received time and achievement of pupils belonging to high and low SES.

15. To study the relationship between POSAR teaching aid Preparation time and achievement of pupils belonging to high and low SES.

16. To study the relationship between POSAR co-curricular activity participation time and achievement of pupils belonging to high and low SES.

17. To study the relationship between POSAR time devoted on hobbies and achievement of pupils belonging to high and low SES.

Teacher Behaviour and Pupil Achievement

18. To study the relationship between teacher explanation behaviour, namely, (a) teacher explain plan, (b) teacher explain need, (c) teacher writing on black board, (d) teacher handling material, and achievement of pupils belonging to high and low SES.

19. To study the relationship between teacher questioning behaviour, namely, (a) teacher asks question, (b) listening to pupil response, and achievement of pupils belonging to high and low SES.

20. To study the relationship between teacher helping behaviour, namely (a) Providing help to pupils, (b) encourage pupils and achievement of pupils belonging to high and low SES.

21. To study the relationship between teacher supervision behaviour, namely (a) supervising seatwork, (b) corrective feedback pupils, and achievement of pupils belonging to high and low SES.

22. To study the relationship between teacher management behaviour, namely, (a) management of disruptive behaviour, (b) giving directions (c) interrupted by outsider and achievement of pupils belonging to high and low SES.

Achievement Prediction

23. To study the Prediction of achievement of high and low SES Pupils by their classroom learning behaviour, out-of school achievement related efforts and teacher behaviour.

Achievement and SES

24. To study the achievement of high and low SES Pupils in science (a) theory, (b) practical and (c) total (theory and Practical aggregate).

Pupil Classroom Learning Behaviour and SES

25. To study high and low SES pupils attention behaviour, namely, (a) listening attentively, (b) looking fatigued, (c) looking distracted and (d) involved in disruptive behaviour.

26. To study high and low SES pupils response behaviour, namely, (a) volunteer response, (b) volunteers ideas, and (c) does not respond.

27. To study high and low SES pupils seatwork behaviour, namely, (a) reading book attentively, (b) pretending to read book, (c) involved in writing, (d) copying from black board, and (e) evading seatwork.

28. To study high and low SES pupils soliciting teacher help behaviour namely, (a) reaches teacher for removing difficulties. (b) for help to complete seatwork, (c) for clarifying doubts, (d) for management of disruptive and (e) waits for teacher help.

29. To study high and low SES pupil-pupil interaction behaviour, namely, (a) discussing a point, (b) giving help, (c) accepting help, (d) responding to pupil question.

30. To study high and low SES pupils helping teacher behaviour, namely, (a) in handling of materials, and (b) on the black board.

31. To study high and low SES pupils classroom managerial activities, namely, (a) teacher directed, and (b) self-directed activity.

Pupil Out-of-School Achievement Related Efforts and SES

32. To study high and low SES Pupils out-of school achievement related study total time.

33. To study high and low SES Pupils out-of school achievement related library study time.

34. To study high and low SES Pupils out-of school achievement related home task time.

35. To study high and low SES Pupils out-of school achievement related curricular study time.

36. To study high and low SES Pupils out-of school achievement related non-curricular study time.

37. To study high and low SES Pupils out-of school achievement related newspaper and magazine study time.

38. To study high and low SES Pupils out-of school achievement related time spent for receiving help from Parents, tutor or both.

39. To study high and low SES Pupils out-of school achievement related teaching and Preparation time.

40. To study high and low SES Pupils out-of school achievement related co-curricular activity Participation time.

41. To study high and low SES Pupils out-of school achievement related time devoted on hobbies.

Hypotheses

Hypotheses may be stated in two forms directional and null. The directional hypothesis states a relationship between the variables being studied or a difference between experimental treatments that the investigator expects to evolve. Directional hypotheses, however, are equally acceptable when the researcher can cite either theory or previous research to support the view that if any difference or relationship is found, it can only be in hypothesised direction.

In contrast to the directional hypothesis, the null hypothesis states that no relationship exists between the variables studied or no difference will be found between the experimental treatments. The null hypothesis does not necessarily reflect the scientists expectations but is preferred by many researchers because this form can be studied in nearly any study that explores a difference or relationship.

In the area of pupils classroom learning behaviour in Indian context and outside also the studies are scanty. There is little supporting evidence for formulating directional hypothesis about the relationships of pupil classroom learning behaviour and their achievement. That is why null hypothesis have been formulated for the Present study. The following null hypothesis were formulated for empirical verification to realise objectives of the study.

Pupil Classroom Learning Behaviour and Achievement

Ho_1 There is no significant relationship between pupil attention behaviour, namely, (a) listening attentively, (b) looking fatigued, (c) looking distracted,(b) involved in disruptive behaviour; and achievement of pupils belonging to high and low SES.

Ho_2 There is no significant relationship between the pupil response behaviour, namely, (a) volunteer response, (b) volunteer ideas, (c) does not respond; and achievement of pupils belonging to high and low SES.

Ho_3 There is no significant relationship between the pupils seatwork behaviour, namely, (a) reading book attentively, (b) Pretending to read the book, (c) involved in writing, (d) copying form black board, (e) evading seatwork; and achievement of pupils belonging to high and low SES.

Ho_4 There is no significant relationship between the pupil soliciting teacher help, namely, (a) reaches teacher for removing difficulties, (b) reaches teacher for help to complete seatwork, (c) reaches teacher for clarifying doubts, (b) reaches teacher for management of disruptive behaviour of peers,(e) waits for teacher help; and achievement of pupil belonging to high and low SES.

Ho_5 There is no significant relationship between pupil-pupil interaction behaviour, namely, (a) discussing a point, (b) giving help, (c) responding to pupil questions, and achievement of pupils belonging to high and low SES.

Ho_6 There is no significant relationship between pupil helping teacher behaviour, namely, (a) in handling of material, (b) on the black board, and achievement of pupils belonging to high and low SES.

Ho_7 There is on significant relationship between pupil involvement in classroom managerial activities, namely, (a) teacher directed activity, (b) self-directed activity; and achievement of pupil belonging to high and low SES.

Pupil Out-of-school Achievement Related Efforts and Achievement

Ho_8 There is no significant relationship between pupil out-of-school achievement related (POSAR) study total time devoted and achievement of pupils belonging to high and low SES.

Ho_9 There is no significant relationship between (POSAR) library study time and achievement of pupils belonging to high and low SES.

H_{10} There is no significant relationship between pupils out-of-school achievement related home task time and achievement of pupils belonging to high and low SES.

Ho_{11} There is no significant relationship between pupils out-of-school achievement related curricular study time and achievement of pupils belonging to high and low SES.

Ho_{12} There is no significant relationship between pupil out-of-school achievement related non-curricular study time and achievement of pupils belonging to high and low SES.

Ho_{13} There is no significant relationship between pupil out-of-school achievement related newspaper and magazine study time and achievement of pupils belonging to high and low SES.

Ho_{14} There is no significant relationship between pupil out-of-school achievement related help received time and achievement of pupils belonging to high and low SES.

Ho_{15} There is no significant relationship between pupil out-of-school achievement related teaching aid preparation time and achievement of pupils belonging to high and low SES.

Ho_{16} There is no significant relationship between pupil out-of-school co-curricular activity Participation time and achievement of pupils belonging to high and low SES.

Ho_{17} There is no significant relationship between pupil out-of-school achievement related time devoted on hobbies and achievement of pupils belonging to high and low SES.

Teacher Behaviour and Pupil Achievement

Ho_{18} There is no significant relationship between teacher explanation behaviour, namely, (a) teacher explain plan, (b) teacher explain need, (c) writing on blackboard, (d) handling material; and achievement of pupils belonging to high and low SES.

Ho_{19} There is no significant relationship between teacher questioning behaviour, namely, (a) teacher ask question, (b) listening to pupil response; and achievement of pupils belonging to high and low SES.

Ho_{20} There is no significant relationship between teacher helping behaviour, namely, (a) providing help to pupils, (b) encouraging pupils; and achievement of pupils belonging to high and low SES.

Ho_{21} There is no significant relationship between teacher supervision behaviour, namely, (a) supervising seatwork, (b) corrective feedback; and achievement of pupils belonging to high and low SES.

Ho_{22} There is no significant relationship between teacher management behaviour, namely, (a) management of disruptive behaviour, (b) giving directions, (c) interrupted by outsider; and achievement of pupils belonging to high and low SES.

Achievement and SES

Ho_{23} There is no significant relationship between high and low SES pupils in science (a) theory, (b) practical and (c) total (theory and practical combined).

Pupil Classroom Learning Behaviour and SES

Ho_{24} There is no significant relationship between high and low SES pupils attention behaviour, namely, (a) listening attentively, (b) looking fatigued, (c) looking distracted, and (d) involved in disruptive behaviour.

Ho_{25} There is no significant relationship between high and low SES pupils response behaviour, namely, (a) volunteer response, (b) volunteer ideas, and (c) does not respond.

Ho_{26} There is no significant relationship between high and low SES pupils seatwork behaviour, namely, (a) reading book attentively, (b) pretending to read the book, (c) involved in writing, (d) copying from black board, and (e) evading seatwork.

Ho_{27} There is significant relationship between high and low SES pupils soliciting teacher help behaviour, namely (a) reaches teacher for removing difficulties, (b) for help to complete seatwork, (c) for clarifying doubts, (d) for management of disruptive behaviour, and (e) waits for teacher help.

Ho_{28} There is no significant relationship between high and low SES pupil-pupil interaction behaviour, namely, (a) discussing a point, (b) giving help, (c) accepting help and (d) responding to pupil question.

Ho_{29} There is no significant relationship between high and low SES pupil helping teacher behaviour, namely, (a) in handling of material, and (b) on the blackboard.

Ho_{30} There is no significant relationship between high and low SES pupils classroom managerial activities, namely, (a) teacher directed activity and (b) self-directed activity.

Pupil Out-of-School Achievement Related Efforts and SES

Ho_{31} There is no significant relationship between high and low SES pupils out-of-school achievement related study total time.

Ho_{32} There is no significant relationship between high and low SES pupils out-of-school achievement related library study time.

Ho_{33} There is no significant relationship between high and low SES pupils out-of-school achievement related home task time.

Ho_{34} There is no significant relationship between high and low SES pupils out-of-school achievement related curricular study time.

Ho_{35} There is no significant relationship between high and low SES pupils out-of-school achievement related non-curricular study time.

Ho_{36} There is no significant relationship between high and low SES pupils out-of-school achievement related newspaper and magazine study.

Ho_{37} There is no significant relationship between high and low SES pupils out-of-school achievement related time spent for receiving help from parents, tutor or both.

Ho38 There is no significant relationship between high and low SES pupil out-of-school achievement related teaching aid preparation time.

Ho_{39} There is no significant relationship between high and low SES pupil out-of-school achievement related co-curricular activity participation time.

Ho_{40} There is no significant relationship between high and low SES pupil out-of-school achievement related time devoted on hobbies.

Delimitation

Due to limitation of time and resources, the present study has been delimited to the following aspects : School Education comprises of three levels, viz., primary, secondary and higher secondary, but the present study has been confined to class X of the secondary stage. Learning takes place inside and outside the classroom. The present study however confines itself to classroom learning behaviour with focus on the learning behaviour of pupils. The pupil is involved in a number of activities at home but the present study covers only achievement related activities which are likely to influence his school achievement. The sample of observation of the classroom learning behaviour can be obtained throughout the session. However, in the present study the observations are confined to two occasions, that is, beginning of the session and towards the end of the session for two consecutive lessons. Classroom observation being a time consuming process, only 20 classroom were taken in the study for observing two pupils of high SES and two pupils of low SES from each class. Intensive observations of only 40 pupils of high SES and 40 pupils of low SES has been carried out. Obviously, the present study is a micro study of pupils classroom learning behaviour.

2

DESIGN AND PROCEDURE

In the preceding chapters conceptual framework outlining specific objectives and hypotheses to be tested and review of related literature have been presented. This chapter purports to describe the design employed, sample selected, tools used, procedure adopted for data collection and statistical treatment carried out.

Design

The present study follows correlational design. Correlational research is similar in many ways to causal comparative research. The correlation coefficients are computed from evidence gathered in causal comparative sets of variables. Correlation studies can be `predictive studies' or ``relationship studies'' or even both. The present study is both correlational as well as predictive. Intercorrelations between classroom learning behaviour of pupils, teacher behaviours, pupil outcome and out-of-school achievement related variable are to be computed for pupils with high and low SES. The prediction includes pupil achievement as criterion variable and the remaining variables as predictors. The inter-correlation between various variables have been conceptualised in Fig. 2.1.

It is evident from the figure that correlational dynamics of pupil classroom learning behaviour, teacher behaviour are directly related with pupil achievement. Other relationships being concomitants, have been shown with dotted arrows.

Strictly speaking the design is correlational, but the various variables have also been treated in the manner of experimental groups for comparison. The design envisages static comparison of high and low SES group of pupils on the variables under study. The purpose is not to establish cause effect relationship. It is confined merely to descriptive comparative analysis in the light of the specific objectives stipulated in Chapter 1.

Sample

The multistage sampling procedure was adopted in the study. The population comprised class X pupils of Science stream in Higher Secondary Schools located in Ajmer city in Rajasthan. At the first stage, 100 sections of class X science subject were identified in these schools. From these, 20 sections were selected at random using the table of random numbers. At the second stage all pupils of 20 sections were administered Socio-Economic Status Scale. The pupils were ranked according to their SES at this stage. Two pupils with highest SES and two with lowest SES from each section were selected. The sample at this stage became purposive and consisted of 80 pupils. These were, therefore, included for observation and recording of their behaviour. The size of the sample was also purposely restricted to eighty pupils because the intensive observation of classroom learning behaviour of pupils is time consuming task. Further the observations were taken at two points of time to be better representative of the session. The first observation was taken in the beginning of the session when teaching work had just started, while the second observation was taken towards the end of the session when students and teachers are generally engaged seriously in the academic work.

Tools Used

There are a number of observation schedules available which have been catalogued in Simon and Boyer (1967). These tools were not found to be relevant as classroom learning

behaviour of pupils did not receive the emphasis which was envisaged in the present study. So, Pupil Classroom Learning Behaviour Observation Schedule (PCLBOS) was designed and constructed by the investigator keeping in view the specific needs of the present study. The tool is briefly described as under :

Pupil Classroom Learning Behaviour Observation Schedule (PCLBOS)

Considering the requirement of the study, the investigator himself prepared the tool (PCLBOS) to observe and record pupil classroom learning behaviour. Observation schedule is an instrument to observe and record not only pupil learning behaviour but also envisages observation and recording of teacher behaviour as mediatorial to pupil classroom learning behaviour.

For identifying categories of pupil classroom learning behaviour, the observational system available in Simon and Boyer (1967) and Cohen (1976) were studied. Besides, four science lessons of class X were observed at four different points of time during the session, two lessons in the beginning and two towards the end of the session. Descriptive notes were taken regarding the classroom learning behaviour of pupils and teacher behaviours either initiators stimuli or responses to pupil behaviours. The observational notes and their contents were analysed. The categories of behaviours emerging from the content analysis were listed. They were grouped in clusters of behaviours on the basis of their relevance and logical interrelationships. From this exercise seven areas emerged. These are : (i) attention, (ii) response, (iii) seatwork, (iv) soliciting teacher help, (v) peer interaction, (vi) helping teacher and (vii) managerial activities. Similar exercise was carried out in respect of teacher behaviours. The teacher behaviour categories emerging out of the analysis are : (i) explanation, (ii) questioning, (iii) helping, (iv) supervising and (v) management according to the function of the behaviour sets.

The present tool has 25 specific pupil classroom learning behaviour categories selected on the basis of their occurrence during the classroom transactions. Some categories were added on the basis of the analysis of the process of instruction.

The teacher behaviours were categorised in five areas. These five areas of teacher behaviours had 13 specific behaviour categories. The tool provides specific pupils classroom learning behaviours on one axis and time in seconds on the other axis. The schedule carries enough space against each item to record observation. After every three seconds a dot is recorded and so every minute almost 20 observations are recorded for each pupil. Like this the recording capacity of one sheet is of six minutes duration and for one pupil usually seven schedule sheets are required to record a lesson of about 40 minutes.

Table 2.1 provides an overview of the tool. It enlists categories alongwith their operational definitions.

TABLE 2.1

PUPIL CLASSROOM LEARNING BEHAVIOUR OBSERVATION SCHEDULE (PCLBOS)

S. No.	Source of Behaviour	Behaviour Area	Category	Definition
1.	Pupil	Attention	(a) Listening attentively	(Applying one's mind) Pupils giving watchful heed to the wishes of others or pupils i.e., the teacher in the classroom. Looking towards the speaker

			showing listening gestures.
		(b) Looking fatigued	Showing signs of weariness, resulting in yawning, dozing, changing sitting posture too often.
		(c) Looking distracted	Diversion of attention symptomised in looking away from the source of communication involved in unsolicited behaviour.
		(d) Involved in disruptive behaviour	The behaviour indicate of disruption like disturbing peers, speaking irrelevant in a tone that takes away other pupil attentiveness from the learning tasks.
2. Pupil	Response	(a) Volunteers Response	Showing eagerness to respond by raising hands or other gestures like partially raising the body. Asking the teacher for permission to respond verbally.

		(b) Volunteers ideas	Using initiative, contributes ideas on his own without being called specifically by one teacher.
		(c) Does not respond	Silence or withholding of reaction to stimulus from the teacher.
3. Pupil	Seatwork	(a) Reading book attentively	The action of persuing written or printed matter, engrossed in reading.
		(b) Pretending to read the book	Posing to read the book showing signs of restlessness though keeping the book in front in ready position, looking away and often without any solicitation.
		(c) Involved in writing	Engaged in writing work assigned by the teacher or voluntarily (as note taking).
		(d) Copying from Blackboard	Writing and noting down the solutions of problems or points written on the blackboard.

		(e)	Evades Seatwork	The act of being engaged in off task behaviour poses as if doing seatwork but involved in disruptive behaviour.
4. Pupil	Soliciting teacher help	(a)	Reaches the teacher for removing difficulties	In the case of difficulties in the assigned learning task or self study, approaches teacher for help.
		(b)	For help to complete seatwork	Solicits help for completion of the seatwork
		(c)	For clarifying doubts	The act or process of seeking clarification of ideas from the teacher.
		(d)	For management of disruptive behaviour	In the event of being disturbed by the peer, reaches teacher for help in the management of disruptive behaviour of the peer.
		(e)	Waits for teacher's help	Gap between the time reaching teacher for help and the time actually received.

5. Pupil	Pupil-Pupil Interaction	(a) Discussing a point	Examination of matter by arguments for and against in a specific direction during classroom interaction.
		(b) Giving help	To deliver, communicate impart or render the necessary assistance to a pupil to fulfil his needs during classroom transaction.
		(c) Accepting help	To take or receive an assistance to fulfil one's need from peers during classroom transaction.
		(d) Responding to pupil's questions	Replying to questions raised by peers in the classroom transaction.
6. Pupil	Extends help to teacher	(a) In handling of material	Helps the teacher in the presentation of aids, teaching material during classroom transaction (as in the case of demonstration).
		(b) On Black-board	The act of pupil writing on the black-board as assigned by teacher or volunteering to solve a sum or problem on blackboard.

7. Pupil	Managerial activities	(a) Teacher directed	Managerial activities like organisation of groups for different tasks, re-arranging of seats etc. as directed by the teacher.
		(b) Self directed	Managerial activities done on his own will without teacher direction.

Teacher Behaviour

8. Teacher	Explanation	(a) Explains plan	Refers to explanation provided according to previous plans of the teacher. Explanation involves a general pupil need but not on immediate pupil need. A scheme of action, project, design, explanation, the way in which it is proposed to carry out some proceeding i.e. detailed description of subject matter in a sequence of long range effect.
		(b) Explains need	It refers to instructional explanation provided to the student to satisfy a clear and

		immediate student need for help. To unfold, interpret and open out to make oneself understand the necessity arising from facts and circumstances of a case or the state of extreme want.
	(c) Writes on black-board	Use of blackboard by the teacher for the purpose of academic instruction and explanation of the content.
	(d) Handles material	Use of material for demonstration or use of teaching aid by teacher in the classroom.
9. Teacher Questioning	(a) Teacher asks question	Stimulus or enquiry made by teacher in order to attain required response from pupils in the classroom on the content taught or to be taught.
	(b) Listens to pupil response	After posing a question or stimulus to a pupil, teacher gives a watchful heed to pupils reply.

10. Teacher Helping	(a) Providing help to pupils	To assist the pupil according to pupils need both solicited or unsolicited.
	(b) Encouraging pupils	To provide reinforcement through encouragement.
11. Teacher Supervision	(a) Supervising seatwork	To go around the class to assist the pupils who are engaged in the seatwork and extend help where needed.
	(b) Corrective feedback	Providing informative unsolicited behaviour or performance in relation to learning objective sets. Promote guidelines for prompting.
12. Teacher Management	(a) Management of disruptive behaviour	Controlling pupil behaviour to avoid disruption of normal classroom transaction.
	(b) Gives directions	Providing direct guidelines to pupils for specific activities.
	(c) Interruption by outsider	The interference, halt or break caused in the flow of teaching learning by intruder in the class.

Pupil Out-of School Achievement Related Efforts Log (POSAREL)

Achievement is the outcome of not only classroom activities, but it is also influenced by out-of-school achievement related efforts. In order to assess these variables the present tool consists of 12 items. The first item deals with identification data. The remaining items purport to collecting data in respect of break-up of the time after school hours on regular day, holiday and during a vacation day. The information Schedule is to be complied by the Student. Their is yet another item on time devoted for any material preparation or participation in various competitions and hobbies. The time devoted to library studies too has been included. It is a self-administrating tool.

Socio-Economic Status Scale Questionnaire (SESSQ)

SESSQ by Kapoor and Singh was used in the present study. The tool seeks information about the component variables; (a) parental occupation; (b) parental education of sisters and brothers; (c) economic index income, house type, material possessions; (d) cultural level of the family as judged by expenditure on newspaper, magazine and material possessions; (e) psychological indicators, -- as level of aspiration, concept of social prestige and belief in caste determining any tendency toward conservatism or progressivism.

The tool is reliable as co-efficient of stability with a gap of one month worked out to r = .89 which is fairly high. The scale was validated against Pandey's scale. Correlation of scores on this scale with those of Pandey's scale was found to be .92

Intelligence Test

Intelligence test was administered in high and low SES pupils in the classroom conditions. Selection of a suitable tool is the first requisite for the study. Some of the group tests of measurement of intelligence are: (i) Udai Shankar's Intelligence Test (1952), (ii) Jalota's Group Test (1951), (iii) Tests by Bureau of Psychology, Allahabad, (iv) Prayag Mehta'a Group Intelligence Test, (v) Hundal's Intelligence Test and (vi) Cattell's Culture Fair Intelligence Test.

Cattell's Culture Fair Intelligence Test was selected for the present study as it has its various scales for different age groups. It does not depend on verbal facility. Scale 3 suiting this group of pupils was used for the present study. It has been used in number of studies for this purpose. This test has form A and form B which are to be administered in continuation. There are four tests in each form i.e. Test-I, 13 items, Test-II, 14 items, Test-III, 13 items and Test-IV, 10 items. The instructions contained in the manual were explained to the pupils and these tests were administered as per the time limit for each test i.e. varying between 5 to 6 minutes. Each item of the test has five choices and the correct one is to be inserted in the form of tick mark (/) in appropriate choice, i.e., a,b,c,d,e of the answer sheet. The instructions need not to be repeated for form B as procedure is exactly the same. Each item carries a score of one. The test, therefor, carries a maximum score of 100. The scores so obtained were converted into pupils' I.Q. by the conversion table as per age of the pupil.

The split half reliability of the test is .76 and test-retest reliability is .77. Its construct validity is .81 and concurrent validity is .70. This has very high reliability and is valid tool i.e. $r = .50$ while A + B gives a value of $r = .72$.

Pupil's Achievement

The effectiveness of the technique of teaching followed in the classroom can be judged by assessing the achievement of pupils. Since the pupils under observation are of Class X of Rajasthan Board of Secondary Education, their marks in the science subject (Chemistry) in the final board examination were considered as their achievement. The marks of board examination in theory, practical and total were treated separately for statistical analysis.

Data Collection

Administration of SES: All the pupils of 20 classrooms selected for the study were administered Kapoor's Socio-Economic status scale in the beginning itself. These scores were used for identifying two pupils with low and two pupils with high SES for intensive observations.

Observer training

Inter and Intra-Observer Reliability : Keeping in view the needful reliable observations, the investigator got intensive training in the use of the observation tool under the guidance of an expert from NCERT. Four observers including the investigator himself were trained in using the Pupil Classroom Learning Behaviour Observations Schedule(PCLOBS) for observing pupil classroom learning behaviour. The training in observation continued till interobserver reliability using Scotts co-efficient of agreement, worked out to be .80 and above. The reliability indiced for the four observers were .80, .81, .85, and .87. Intra observer reliability was worked out through coding a taped lesson with a gap of two weeks, ranged between .79 and .83. These indices were considered reliable for coding the pupils classroom learning behaviour.

Observation of Lessons

Pupil Classroom Learning Behaviour Observation Schedule consists in all 25 pupil and 13 teacher categories and enough space in front to record the tallies of the individual pupil and teacher behaviour in the form of mark dot (.). One minute observation space has been equally divided into 20 equal parts i.e. each such dot or sub part denote 3 seconds time. After every 3 seconds the tally (dot) is recorded by the trained observer under the specific behaviour categories mentioned in the tool. The observation of two sets of high SES group and low SES group pupils was done by the investigator and one trained supervisor separately. The observations, of high and low SES pupils identified before, were recorded form ventage point in the classroom. The tool carries seven sheets for each pupil, which have capacity to record 42 minutes observation. The efforts were made to observe the pupils under study for full period of 40 minutes duration. The tallies dots were correctly recorded under appropriate categories of behaviour and the change was specially noted in terms of tally when a particular behaviour changed.

Pupils of high and low SES who formed the sample of the study, were observed four times on two occasions in one academic session during four lessons in science subject for their classroom learning behaviour with the help of the tool PCLBOS. First they were observed for two lessons on consecutive days in the beginning of the session I.e. in July- August. 1981. When the teaching had just started. Second time the observation of classroom learning behaviour of the selected pupils was done towards the end of the academic session in January- February, 1982 when teacher and pupils appeared to be seriously preparing for the examinations. Thus, every pupil was observed for four periods on four occasions. The average of two consecutive lessons at the end of session was taken and such averaged

percent occurance of specific behaviours were treated as beginning of session lesson observation (BSL) and end of session lesson observation (ESL). Simultaneously, relevant teacher behaviour included in the PCLBOS was also observed and recorded in the recording sheet.

Administration of Cattell's Culture Fair Intelligence Test

Cattell's Culture Fair Intelligence Test was administered to the selected pupils individually. Responses were to be marked on separate response sheets, thus permitting re- use of the test booklets.

While administering the test the time limit was strictly adhered to and under no circumstances altered to allow fewer or more persons to complete a given subtest. A stop watch was used as a timer. Older children could complete a sub-test before the allotted time. This was expected and were provided for in the norm tables. Instructions were presented exactly as given in the tool for each subtest. The rooms where tool was administered were well lighted, desks widely spaced and each pupil had two pencils with erasers. The pupils were asked to fill the top columns of personal particulars before the test commenced. Appropriate introductory instructions were given to put the examinees at ease and to motivate them to do as best they could. In a friendly and unhurried way the instructions were read out to them. The tools so administered provided the raw scores which were converted into IQ scores, by conversion table given in the booklet in respect of administration of the tool.

Administration of pupil out- of-school Achievement Related Efforts Log (POSAREL)

The tool prepared by the investigator is unique in its nature. it was administered to the pupils under study for assessing the impact of out-of-school efforts on their achievement. The pupils

were asked to give correct break-up of the time for each activity. The tool was administered in February, 1982 at the end of the session.

Pupil Achievement Data

The achievement score in respect of each of the pupils analysed in the study were collected by the investigator from the respective school record after they received their original certificates in school from Rajasthan Secondary Education Board. The marks in theory and practical separately and their total marks in science subject in respect of each test, were noted on a proforma by the investigator and these marks as such were treated as achievement scores of pupils.

Scoring and Tabulation of the Data.

Scoring and tabulation of responses in respect of various tools used in the study was done manually by the investigator. In the case of classroom learning behaviour of pupils and teacher behaviour categories, the frequencies were totalled and converted into percentages. These percentages were used for computerisation of statistical indices.

In the case of intelligence test the scoring was done with the help of the key. The raw scores so obtained were converted into IQ scores by the conversion table given in the manual. The socio economic status scores were obtained by simply adding the total points scored by pupils as per their responses. Similarly, the pupils' out-of-school achievement related efforts scores were obtained in terms of time as per pupils' performance for each item listed in the tool.

The data processing was done at the computer centre in the ``Council for Social Development'' at New Delhi. The different variables involved in the study, namely, pupil classroom learning behaviours, teacher behaviours, pupil out-of-school achievement related efforts, socioeconomic status of pupils, intelligence and achievement of pupils were tabulated in terms of scores as per observations done and were coded for feeding these scores to computer as specified in Table 2.2.

TABLE 2.2

VARIABLE CODES FOR COMPUTERISATION

S. No.	Code No	Variable	Description	Abbreviation
1.	53	Intelligence Score	(Intelligence)	
2.	54	Achievement	Theory	
3.	55	"	Practical	
4.	56	"	Total	
Out-of-School Achievement Related Efforts				
5.	57	Total Time	Working day (in minutes)	
6.	58	"	Holiday	
7.	59	"	Vacation day	
8.	60	Library Time	Working day (in minutes)	

9.	61	"	Holiday
10.	62	"	Vacation day
11.	63	Home Task	Working day (in minutes)
12.	64	"	Holiday
13.	65	"	Vacation day
14.	66	Curricular Studies	Working day (in minutes)
15.	67	"	Holiday
16.	68	"	Vacation day
17.	69	Non-curricular Study	Working day (in minutes)
18.	70	"	Holiday
19.	71	"	Vacation day
20.	72	Newspaper Magazine Study	Working day (in minutes)
21.	73	"	Holiday
22.	74	"	Vacation day
23.	75	Helped received	(time in minutes)
24.	76	Teaching aid preparation	(time in minutes per week)

25.	77	Curricular activity	(Yearly time in hours)
26.	78	Hobbies	(Time per week in hours)

Teacher Behaviour

	BSL	ESL	Variable	Abbrevition
Explanation				
27.	200	213	Teacher explains plan	TEP
28.	201	214	Teacher explins need	TEN
29.	202	215	Techer writes on blackboard	WBB
30.	203	216	Techer handles material	THM
Questioning				
31.	204	217	Teacher asks question	TAQ
32.	205	218	Teacher listens to pupils' responsse	LPR
Helping				
33.	206	219	Providing help to pupils	PHP
34.	207	220	Encouraging pupils	EP
Supervision				
35.	208	221	Supervising seatwork	SSW

36.	209	222	Corrective feedback	CFB
Management				
37.	210	223	Mnagement of disruptive behaviour	MDB
38.	211	224	Gives directions	GD
39.	212	225	Interruption by outsider	IOS
Pupil Clssroom Learning Behaviour				
Attention				
40.	226	251	Listening Attentively	LA
41.	227	252	Looking fatigued	LF
42.	228	253	Looking distracted	LD
43.	229	254	Involved in distuptive behaviour	IDB
Response				
44.	230	255	Volunteers response	VR
45.	231	256	Volunteers ideas	VI
46.	232	257	Does not respond	DR
Seatwork				
47.	233	258	Reading book attentively	RBA

48.	234	259	Pretending to read the book	PRB
49.	235	260	Involved in writing	IW
50.	236	261	Copying from blckboard	CBB
51.	237	262	Evades seatwork	ESW
Soliciting Teacher Help				
52.	238	263	Reaches teacher for removing difficulties	RRD
53.	239	264	For help to complete seatwork	RCSW
54.	240	265	For clrifying doubts	RCD
55.	241	266	For mngement of distuptive behaviour	MDB
56.	242	267	Waiting for teacher help	WTH
Interaction				
57.	243	268	Discussing a point	DP
58.	244	269	Giving help	GH
59.	245	270	Accepting help	AH
Helping				
60.	246	271	Responding to pupil questions	RPQ
61.	247	272	Helping teacher in handling material	HHM

62. 248 274 Helping teacher on blackboard HBB

Managerial Activity

63. 249 284 Teacher directed activity TD

64. 250 275 Self Directed activity SD

Note : BSL : Beginning of Session Lesson
ESL : End of Session Lesson

Statistical Analysis

Descriptive, correlational, inferential, and predictive statistics were used for analysis of the data. Means and standard deviations for each of the Variables were computed, Inter-correlation using Pearson correlation, t-test were employed in respect of high and low SES group of pupils, Stepwise regression analysis was used to predict pupil achievement in science: theory, practical and both taken together for high and low SES groups separately.

The chapter has presented the design and procedure followed and sets the stage for presenting results in the chapters to follow.

3

Results: Correlational and Prediction

In the preceding two chapters, description of the problem, survey of related studies and methods and procedure for data collection has been presented, In this chapter, an attempt has been made to present analysis and interpretation of the data alongwith discussion of the results in respect of variables pertaining to pupil behaviour, that is, pupils classroom learning behaviour, pupils out-of-school achievement related activities and achievement of pupils in respect of their socio-economic status.

In may be recalled that the present study purports to compare two groups of pupils belonging to high and low socio-economic status on their classroom learning behaviours, out-of-school achievement related efforts, intelligence and the criterion variable of achievement in science, Besides pupil learning behaviours, concomitant data in respect of classroom behaviour of teachers as a complimentary foil to pupil classroom learning behaviour has been presented.

It may further be recalled that this study also purported to explore the relationship between classroom learning behaviour of pupils, their out-of-school achievement related efforts, teacher behaviour, intelligence and criterion variable of achievement, Further an attempt has been made to predict pupil achievement in science through the predictor variables of pupil classroom learning behaviour For correlation analysis pearson product

moment correlation method was used, For the prediction of achievement stepwise regression was used. The inferential results in respect of the PCLB, POSARE, intelligence and achievement of pupils with high and low SES have been derived out of the application of t-test of uncorrelated means.

The presentation in this chapter has been divided into three sections, The first section covers correlational profile in which correlation between different sets of variables have been presented. It is followed by the results relation to prediction of achievement of pupils with high and low SES.

Correlational Results

This section purports to provide correlational results among different sets of variables, Table 3.1 to 3.4 provide product moment correlation values in respect of different sets of variables based on the observation of lessons recorded in the beginning of the session and in the end of the session in respect of high SES and low groups of pupils.

TABLE 3.1

CORRELATION BETWEEN PUPIL CLASSROOM LEARNING BEHAVIOUR AND PUPIL ACHIEVEMENT

S. No.	Pupil Classroom Learning Behviour		Achievement					
			Theory		Practical		Total	
		Lesson	SES(H)	SES(L)	SES(H)	SES(L)	SES(H)	SES(L)
1.	Listening attentively	BSL	.09	.08	.05*	.16	.05	.01
		ESL	.07	.24	.35	.04	.09	.17

2.	Looking fatigued	BSL	-.10	-.1	-.01	-.33*	-.08	-.29*
		ESL	.21*	.13	-.14	-.28*	.10	-.02
3.	Looking Distracted	BSL	-.16	-.10	.06	.37**	-.10	.07
		ESL	.10	-.06	.02	.09	.09	-.01
4.	Involved in disruptive behaviour	BSL	-.08	.02	-.12	.27*	-.12	-.09
		ESL	-.23*	-.04	-.07	.13	-.22*	.03
Response								
5.	Volunteer response	BSL	.17	.23*	-.09	.04	.10	.22*
		ESL	.07	.01	-.03	-.02	.04	-.01
6.	Volunteer ideas	BSL	-.09	.26*	.08	-.02	-.03	.19
		ESL	-.18	.07	.04	-.05	-.13	.04
7.	Does not respond	BSL	-.33*	.05	.02	.19	-.27*	.12
		ESL	___	___	___	___	___	___
Seatwork								
8.	Reading book attentively	BSL	-.04	-.09	-.04	.09	-.05	-.04
		ESL	.01	-.01	-.29*	-.20	-.13	-.09
9.	Pretending to read book	BSL	-.10	.01	.14	-.16	-.02	-.06
		ESL	.04	.14	-.08	-.25	-.07	.01
10.	Involved in writing	BSL	.06	.03	.19	.02	.03	.01
		ESL	-.21*	-.18	.46**	.21*	.04	-.05
11.	Copying from blackboard	BSL	-.04	-.27*	.09	-.15	.01	-.15
		ESL	.03	-.05	-.14	-.25*	-.04	-.15

12. Evades seatwork	BSL	-.32*	-.26*	.05	-.09	-.28*	-.24*
	ESL	___	___	___	___	___	___
Soliciting Teacher Help							
13. Reaches teacher for help to remove difficulties	BSL	.20	.26*	.03	-.06	.18	.23*
	ESL	-.15	-.22*	.16	-.01	-05	-.18
14. For comp-	BSL	___	___	___	___	___	___
leting seatwork	ESL	.10	.09	.28*	.26*	.20	.18
15. For Clrify- ing doubts	BSL	-.20	-.03	-.05	-.25*	-.18	-.13
	ESL	-.1	-.04	.20	.29*	.01	.09
16. Manage- ment of disruptive behaviour	BSL	.16	___	-.01	___	.13	___
	ESL	-.04	___	.12	___	-.02	___
17. Waits for teacher help	BSL	___	___	___	___	___	___
	ESL	-.12		.12		-.04	
18. Discussing a point	BSL	.10	-.24*	.14	.18	.15	-.12
	ESL	-.28*	-.06	.34**	-.02	-.07	-.05
19. Giving help	BSL	.37**	.03	-.03	.23*	.28*	.12
	ESL	-.27*	___	.04	___	-.12	___
20. Accepting help	BSL	-.16	.06	-.03	.08	-.14	.08
	ESL	___	___	___	___	-.12	___

21. Responding to pupil questions	BSL	___	-.23*	___	-.05	___	___
	ESL	___	___	___	___	___	___
Helping Teacher							
22. Helping teacher in handling of material	BSL	.31*	___	-.11	.20	___	___
	ESL	___	___	___	___	___	___
23. Helping teacher on blackboard	BSL	.05	.07	.04	.17	.06	.02
	ESL	-.17	-.09	.22*	.17	-.04	.00
Managerial Activities							
24. Teacher directed activity	BSL	.22*	-.21*	.47**	-.01	.38**	-.17
	ESL	.17	.04	.38**	.05	.31*	.05
25. Self directed activity	BSL	-.23*	-.01	.06	.25*	-.15	.10
	ESL	.31*	-.22*	.06	.03	.28*	-.16

BSL : Beginning of Session Lesson. ESL : End of Session Lesson
SES (H): High Socio-economic Status. SES(L) Low Socioeconomic Status

* Significant at .05 level.
** Significant at .01 level.

Pupil classroom Learning Behaviour and Achievement

Correlations between pair of variables relating to pupil classroom learning behaviour in respect of high and low SES group of pupils and achievement in Science are presented in Table 3.1. Pupil classroom learning behaviour have two sets of observations: one for beginning of the session and another for end of the session lessons, However, pupil achievement is designated by the final examination marks constituting only one set of observation. An examination of the Table will show that the direction of correlation are, by and large, the same in two sets of observations. The results can be viewed areawise as envisaged in the objectives and the hypotheses stated in Chapter 1.

Pupil Attention and Achievement

Listening attentively has positive correlation with achievement in the beginning of the session in the case of both groups of pupils. Towards the end of the session the low SES group of pupils in theory and high SES group of pupils in practical show correlation significant at .05 level. It may be due to the fact that pupils pay more attention to practicals towards end of the session. In the case of achievement the correlation is higher in respect of low SES group of pupils as compared to high SES group of pupils. It implies that the low SES pupils are more attentive in theory when compared to high SES pupils. However, the correlations of this behaviour with other measures of pupils achievement are positive without reaching significance level. Null Hypothesis Ho_1 (a) is therefore rejected. Bloom (1976) and McKinnery (1975) found clear and consistent relationship between student attention with their achievement. Thus the findings of the present study in respect of this behaviour is supported.

Looking fatigued has negative correlation with practical and total achievement significant at .05 level in the case of low SES Pupils in the beginning of session, but the value is very low

at the end of the session. Distraction and Involvement in disruptive behaviour have Positive correlations with Practical achievement reaching significance level of.05 in the beginning, while towards the end the values decline. The achievement in theory and total achievement attains negative values significant at.05 level in the end of session observation in respect of disruptive behaviour of pupils with high SES group. However, the corresponding values are less for low SES group. So null hypothesis Ho 1 is rejected. Mc Donald (1978) supports this finding.

Pupil Response Behaviour and Achievement

Pupil response behaviour area has three specific behaviours namely, volunteers response, volunteers ideas and does not respond. Volunteer response has positive correlation with theory and total achievement reaching a significance level of.05 in the case of low SES pupils in the beginning of the session, whereas these values decline towards the end of the session, remaining positive and low. Volunteering ideas correlate significantly (.05 level) in theory achievement of low SES group of pupils while the value of total achievement correlation is tending to reach significance level in the beginning of the session. Mc Fadden (1979) and Kounin (1970) also revealed similar results. No response behaviour too has positive correlation with theory achievement and total reaching significance level of .05 in the beginning of the session in case of high SES pupils. Null hypothesis Ho_2 is therefore rejected.

Seatwork and Achievement

Reading book attentively as well as pretending to read book in the classroom have negative correlation with pupils achievement in science, The correlation between reading book attentively and pupil achievement in science practical has reached a significance level of .05 It may be due to the role of

reading as a preparatory exercise for doing practicals. It may be due to the fact that science requires more doing and mere reading is not sufficient for achievement in theory. It requires much more doing for the development of understanding. More lecturing and reading from the book is not conducive to achievement in science. Null hypotheses Ho3 (a) and (b) are, therefore, rejected.

Involvement in writing has positive correlation significant at levels .05 to .01 with practical and negative correlation with theory achievement in both groups of pupils at the end of the session, but with total achievement it shows very low correlation. Surprisingly, this behaviour is positively correlated with achievement in practical in the end of the session lesson observation in both groups of pupils. Probably, pupils are not trained in taking notes and so while writing they might be missing some of verbal conversation in theory affecting their achievement adversely. Null hypothesis Ho_3 (c) is, therefore, rejected.

Copying from blackboard shows negative correlation in both the cases on both occasions. The negative r-value is significant at .05 level in theory achievement in the beginning and in practical towards the end of the session in low SES group of pupils. It reveals that pupils who copy more from blackboard for theory lesson in the beginning of the session and for practical lessons towards the end of the session do not show better achievement. Null hypothesis Ho_3 (d) is, therefore, rejected. Pupil classroom learning behaviour of evading seatwork has been found to be negatively correlated with pupils achievement in theory and total achievement reaching significance level of .05 in the case of both the groups in the beginning of the session observation. So null hypothesis Ho3 (e) is, therefore, rejected. Rosenshine (1978) reported that seatwork behaviour occured about 60 to 70 percent and was highly related with achievement. Kounin (1970) shows the significant correlation of supervision and pupil achievement.

Soliciting Teacher Help and Achievement

Reaching teacher for removing difficulties has positive and significant correlation with theory and total achievement ($p < .05$) in the beginning of the session. The r-value declines towards the end and attains negative values in both the groups. It shows that teacher help for removing difficulties is more useful to pupils when they are covering the content for the first time in the beginning of session.

Reaching the teacher for help to complete seatwork is conspicuously missing in the beginning of the session observation. It may be due to either indifference of the pupil or due to lack of classroom trust in the beginning. However, the behaviour has been found to be positively correlated with pupils achievement in practical reaching significance level of .05 at the end of the session observation in both the groups of pupils. It implies that both the groups of pupils seek help to complete seatwork to great extent towards the end of the session because the difficulty level of content as well as the class assignments increases towards the end of the session. Obviously, the pupils require more help from the teacher for conducting practicals.

Pupil reaching teacher for clarifying doubts show negative correlation values in the beginning while positive values towards end of the session observations. The r value is significant at .05 level in the case of low SES group with their achievement in practical having negative value in the beginning and positive value towards end of the session observation while high SES group of pupils also show similar trend in r values without reaching significance level. It reveals that both the group of pupils seek more clarification towards the end of the session, may be due to the approaching examinations. So null hypotheses Ho_4 (a), (b) and (c) are rejected while Ho_4 (d) and (e) cannot be rejected.

Pupil-Pupil Interaction and Achievement

Pupil interaction for discussing points has been found to be negatively correlated with pupil achievement in theory in the case of low SES group of pupils reaching significance level of .05 while it is positively correlated with practical achievement significant at .01 level in the case of high SES group of pupils in the end of the session lesson observations. The negative correlation in the case of achievement in theory may be due to irrelevant points being discussed. The positive correlations in the case of practical work may be due to the fact that it involves specific sharing of experience in the skills to conduct an experiment and discussion about specific data emerging from the experiment.

The behaviour of giving help has shown positive correlations in both groups of pupils. The r value is significant at .01 level and .05 level in theory and total achievement respectively in the case of high SES pupils. Achievement in practical, correlation reaches a significance level of .05 in the case of low SES pupils. Correlation in theory, practical and total achievement in respect of low SES pupils have low but positive correlations in the beginning of the session. Differentially, high SES pupils comparatively give less help but ask of more help. Null hypothesis Ho_5 (a) and (b) are rejected, while Ho_5 (c) and (d) cannot be rejected. Evan (1979) also reported similar results in respect of pupil-pupil interaction and pupil achievement. Wright and Nuthall (1970) indicated pupil-pupil helping had positively significant correlation with pupil achievement.

Helping Teacher and Pupil Achievement

Pupil extending help to the teacher in handling material like apparatus and teaching aid used in the classroom are positively related to pupil achievement in theory reaching a significance level of .05 in high SES group in the beginning of the session.

Helping the teacher in blackboard work is positively related to achievement in practical while it is negatively with theory achievement. Null hypothesis Ho_6 is, therefor, rejected.

Classroom Managerial Activity and Achievement

Teacher directed activity and achievement are positively correlated with pupil achievement in theory as well as practical, the significance level ranging from .05 to .01 level. It may be inferred that classroom managerial activities as directed by teacher contribute to pupil achievement in theory as well as practical on both the occasions in respect of both (high and low SES) groups of pupils. Null hypothesis Ho_7 (a) is, therefore, rejected. The results are supported by researches in respect of direct instruction reviewed in Rosenshine (1982). Self-directed activity shows negative correlation (significant at .05 level) with high SES pupils' achievement and positive significant correlation ($p < .05$) with low SES pupil achievement in the beginning of the session. At the end of the session, it is just the opposite as high SES pupils show positive correlations significant at .05 level and low SES pupils show negative and significant correlations. Considering differentially, the high SES pupil involvement in self-directed activities is less in the beginning of the session as compared to the end of the session. The low SES pupils seem to get involved in self directed activity more in the beginning as compared to towards the end of the session. Null hypothesis Ho_7 (b) is, therefore, rejected. Kounin (1970) indicate self-directed positively related to achievement. Naidu (1981), however, found no significant difference in classroom management behaviour and the achievement.

From the results presented above several findings emerged. Firstly, the attentively listening behaviour of the pupils is correlated with pupil achievement in practical. The correlations are higher in case of low SES pupils. In case of achievement in theory also the correlations are positive and higher in favour of

high SES pupils. The finding further confirmed by significant negative correlations of pupil achievement and looking fatigued, looking distracted as well as involved in disruptive behaviour. The responsive behaviour shows positive and significant correlations with achievement in theory while corresponding correlation values are high in low SES group of pupils. The seatwork behaviour of pupils like involved in writing shows positive and significant correlation with achievement in practical while other behaviours show a negative trend in correlations with achievement in theory and practical. Soliciting teacher help for seatwork and for removing difficulties indicates positive significant correlations with achievement in theory in both the groups of pupils, while clarification of doubts shows negative case of low SES group. Pupil-Pupil interaction behaviour like discussing a point and giving help correlations are positive and significant with achievement in practical and theory in case of high and low SES group respectively while negative relations are shown by accepting help and pupil-pupil response behaviour in both the groups. Both the groups show positive correlations in pupil helping teacher behaviour and managerial activities for their achievement in theory and practical. The values are higher in case of high SES group.

Pupils Out-of-School Achievement Related Efforts and Achievement

Correlation between sets of variables in respect of pupils out-of-school achievement related efforts and pupils achievement in science theory, practical and total in respect of high and low SES group of pupils are presented in Table 3.2.. It may be recalled that the achievement related efforts have been worked out in terms of the time devoted by the pupils relating to different activities on a working day, a holiday and a vacation day. It has been computed in minutes per day in respect of variables 1 to 7 and in terms of time in minutes per week of variable 8, time in hours yearly in the case of variable 9, while time is considered in terms of weekly hours in the case of variable 10.

A perusal of the correlations in Table 3.2 reveals that the total time devoted to different achievement related out-of-school activities are positively correlated with achievement in practical reaching a significance level of .05 to .01 in case of high and low SES groups of pupils. Its correlations with achievement in theory are low but positive. Thus, it shows that the total time devoted on a working day tends to influence pupil achievement. The same pattern of results follow in respect of the total time devoted on a holiday and vacation day. The three sets of correlations provide an indication of this trend. It reveals that more the time devoted on a working day, a holiday and a vacation day, the more it contributes to pupil achievement in theory, practical and total. Null hypothesis Ho_8 is, therefore, rejected. This finding is supported by earlier research on home environment. (Marjoribanks, 1974; Kalinowski and Sloane, 1980; Janhom, 1983).

TABLE 3.2

CORRELATION BETWEEN PUPIL OUT-OF-SCHOOL ACHIEVEMENT RELATED EFFORTS AND ACHIEVEMENT

S. No.	Pupil Out-of-School Achievement Related Efforts	Achievement					
		Theory		Practical		Total	
		SES(H)	SES(L)	SES(H)	SES(L)	SES(H)	SES(L)
	(Time in minutes per day)						
1.	Total Time						
	(a) Working day	.07	.21*	.21*	.02	.15	.15
	(b) Holiday	-.04	.09	.40**	.12	.15	.12
	(c) Vacation day	.05	.16	.50**	.08	.27*	.09

2. Library Study Time						
(a) Working day	.03	-.02	.19	-.20	.11	-.11
(b) Holiday	.03	-.07	.10	-26*	.07	-.17
(c) Vacation day	.02	-.07	.26*	-.12	.13	-.12
3. Home task Time						
(a) Working day	-.20	-.12	-.03	-.05	-.15	-.11
(b) Holiday	.28*	.02	.22*	.19	.30*	.09
(c) Vacation day	-.15	-.15	.30*	-.03	.01	-.13
4. Curricular Study Time						
(a) Working day	.05	-.11	.25*	.28*	.15	.03
(b) Holiday	-.14	.22*	.30*	.24*	.02	.27*
(c) Vacation day	-.04	.15	.24*	.29*	.07	.24*
5. Non-curricular Study Time						
(a) Working day	.07	-.18	-.05	-.09	.04	-.18
(b) Holiday	.18	-.23*	.10	-.01	.19	-.19
(c) Vacation day	.02	-.27*	.06	.10	.04	-.26*
6. Newspaper and Magazine Study Time						
(a) Working day	.16	-.17	17	-.37**	.20	-.29*
(b) Holiday	.28*	.03	.26*	-.08	.34*	-.01
(c) Vacation day	.26*	-.12	.23*	-.02	.31*	-.11
7. Help received time	.17	.23*	.13	.05	.20	.16
8. Teaching aid preparation time (weekly)	.05	.03	.17	.14	.11	.08

9. Co-curricular activities participation time (yearly in hours)	.19	-.12	.26*	-.06	.27*	-.12
10. Hobbies time devoted (Weekly in hours)	-.04	.40**	-.17	.38**	-.11	.48**

BSL : Beginning of Session Lesson. ESL : End of Session Lesson
SES (H): High Socio-economic Status. SES(L) Low Socioeconomic Status

* Significant at .05 level.
** Significant at .01 level.

The differential correlations emerging from the distribution of time among different activities on a working day, a holiday and a vacation have been elaborated in Table 3.2. Time devoted to library study is positively correlated with achievement in science practical which is significant at .05 level in the case of high SES group on a vacation day while other correlations are also of positive values but not reaching significance level. Low SES group of pupils achievement in practical is negatively correlated on a working day and a vacation day and is negatively significant ($p < .05$) on holiday time devoted to library study. Correlations are, however, positive in the case of high SES and negative in the case of low SES group of pupils with their achievement in theory, practical and total achievement respectively. Null hypothesis Ho_9 is, therefore, rejected. Sudame (1973) established relationship between use of library and academic achievement.

The time devoted on home task is positively correlated with achievement in practical significant at .05 level in the case of high SES group on a holiday and a vacation day. There is positive correlation with achievement in theory significant at .05 level in the case of high SES group on a holiday. The correlations are low and negative in the case of low SES group of pupils. Indifferently designed home assignment, absence of correlative feedback or both, may be the viable reasons for the finding. The correlations in the case of achievement in practical are high may be due to the fact that it involves specific task which is duly checked by the teacher. Null hypothesis Ho_{10} is, therefore, rejected. Kirkire (1981) also discovered the same phenomenon. Home task in terms of more assignment given by teachers was found to have significant effect on the achievement of pupils.

Time devoted on curricular study is positively correlated with achievement in practical significant at .05 level in the case of both the groups of pupils on a working day. A holiday and a vacation day. Curricular study on a holiday too are positively correlated with achievement in theory significant at .05 level in the case of low SES group of pupils. The achievement in science total is showing positive correlations in case of both the groups while correlations are significant at .05 level on a holiday and a vacation day in the case of low SES group of pupils. Null hypothesis Ho_{11} is, therefore, rejected.

Time devoted to non-curricular study have exhibited negative correlation with achievement significant at .05 level in low SES pupils on a holiday and a vacation day. Null hypothesis Ho_{12} is, there, rejected. Newspaper and magazine study time have positive correlations with theory, practical and total achievement significant at .05 level in the case of high SES pupils on holiday and vacation day while low SES pupils working day time exhibit negative correlations (significant at .01 level) with achievement in practical. Null hypothesis Ho_{13} is, therefore, rejected.

Help received time from parents, tutor or both shows positive correlational trend, however, achievement in theory is correlated significant at .05 level in the case of low SES group of pupils. Other correlation values are positive without reaching significance. So null hypothesis Ho_{14} is rejected. The finding is supported by Wolf (1964-66); Bronflenbernner (1974), Marjoribanks (1974); Iverson & Walberg (1979); and Kalinowski and Sloane (1980).

Teaching aid preparation time showing positive and low correlations without reaching significance proves that null hypotheses Ho_{15} cannot be rejected.

Pupils time devoted to co-curricular activities is positively correlated with achievement in practical and total achievement significant at .05 level in the case of high SES group of pupils. Differentially `r' value is negative in the case of low SES pupils while it is positive and higher in the case of high SES group of pupils. Null hypothesis Ho_{16} is, therefore, rejected.

Time devoted to hobbies is positively correlated with pupil achievement in theory, practical and total, significant at .01 level in each in the case of low SES group of pupils. High SES group of pupils show negative and low correlations with their achievement. It may be on account of the fact that low SES group of pupils make hobbies as a means of earning while learning. So null hypotheses Ho_{17} is rejected. The findings of the study are supported by the earlier researches (Dolan, 1980; Kalinowski and Sloane, 1980: Iverson and Walberg, 1979).

It can be seen from the above discussion that total time, home task time, curricular study time, help received time and time devoted on hobbies have shown positive and high correlations with achievement in high or low SES group of pupils. The library study time, non-curricular study time and newspaper and magazine study time too show negative correlations with the

pupil achievement. However, the more the time pupils devoted on achievement related efforts at home, the more will be their achievement, gets a support from this section correlations.

Teacher Behaviour and Pupil Achievement

Teacher behaviour has been divided into five areas, namely, explanation, questioning, helping, supervision and management. Table 3.3 presents correlations between sets of teacher behaviours observed on two different occasions, that is, in the beginning and end of the session with respect to pupils achievement in theory, practical and total in respect of high and low SES groups of pupils.

TABLE 3.3

CORRELATION BETWEEN TEACHER BEHAVIOUR AND PUPIL ACHIEVEMENT

S. No.	Teacher Behviour		Achievement					
			Theory		Practical		Total	
		Lesson	SES(H)	SES(L)	SES(H)	SES(L)	SES(H)	SES(L)
Explanation								
1.	Teacher explains plan	BSL	.04	-.01	-.05	.04	.01	.01
		ESL	.20	.18	.30*	-05	.03	.12
2.	Teacher explains need	BSL	.18	.12	.28*	.21*	.02	.01
		ESL	.15	.03	.05	-.05	.14	.01
3.	Teacher writes on blackboard	BSL	-.01	.21*	-.23*	-.25*	-.11	.06
		ESL	-.24*	-.19	.18	.12	-.11	-.10

4. Teacher handles material	BSL	-.10	.19	.09	.23*	-.04	.24*
	ESL	.13	.01	-.14	-.02	.04	-.01
Questioning							
5. Teacher asks questions	BSL	.09	.17	-.21*	-.14	-.02	.08
	ESL	-.35**	-.10	-.04	.07	-.30*	-.05
6. Listen to pupils response	BSL	.18	.05	-.14	-.06	.08	-.03
	ESL	-.01	-.08	.17	-.05	.08	-.08
Helping							
7. Providing help to Pupils	BSL	-.09	.07	-.15	.13	-.01	.11
	ESL	-.10	-.05	.16	.12	-.01	.01
8. Encouraging pupils	BSL	.27*	.17	-.15	-.10	-.28*	.09
	ESL	.21*	.22*	.22*	.13	.27*	.23*
Supervision							
9. Supervise-ing Seatwork	BSL	-.03	-.07	.22*	.30*	-.01	.07
	ESL	-.24*	-.24*	.12	.04	.14	.17
10. Corrective feedback	BSL	.19	.19	.15	.06	-.09	-.13
	ESL	.41**	.35**	-.07	-.01	.36**	.28*
Management							
11. Management of Disruptive behaviour	BSL	-.05	-.04	-.27*	-.26*	-.16	-.14
	ESL	.37**	.22**	-.04	.05	.28*	.19

12. Giving direction	BSL	.05	-.07	.19	-.01	.04	-.06
	ESL	.15	.13	.10	-.10	.17	.06
13. Interruption by outsider	BSL	.03	.09	.19	.14	.11	.17
	ESL	-.03	.18	-.01	.18	-.03	.20

BSL : Beginning of Session Lesson.
ESL : End of Session Lesson
SES (H): High Socio-economic Status.
SES(L) Low Socioeconomic Status

* Significant at .05 level.
** Significant at .01 level.

Teacher Explanation and Pupil Achievement

Teacher explanation behaviour has four specific behaviours, namely, explanation plan, explanation need, writhing on blackboard and handling of material. These behaviours have been discussed in relation to pupil achievement in theory, practical and total. It can be seen from the table that teacher explanation plan has a negative correlation with pupil achievement in practical while lit is positively correlation with their achievement in theory in both sets of observation. Teacher explanation need which is in response to pupil solicitation has positive correlation with achievement of both groups of pupils on both the occasions with a gradual increase in r value towards the end of the session. The practical achievement shows negative correlations significant at .05 level in the beginning of the session for both groups of pupils which implies that teacher has to give more clarification in theory than in practical in the beginning as well as at the end of the session. The explanation need increases towards the end probably because of onset of examination mood.

Teacher writhing on blackboard shows negative correlation with pupil achievement in the case of both groups of pupils in beginning as well as end of the session. The achievement in Practical shows negative correlations significant at.05 level in both the groups of pupils with some increasing trend towards the end of the session. Achievement is Positively correlated with blackboard writing ($p < .05$). The direction of results is reversed in the end of the session lessons. It may be due to the teachers lack of competence in the use of blackboard.

Handling material by teacher in the classroom is positively correlated with pupil achievement ($p < .01$) in case of low SES group with a decreasing trend towards the end of the session. This variable, however, does not show significant results in the case of high SES . It may be inferred that low SES pupils are more benefited by demonstration in the class as compared to high SES Pupils. Null hypothesis Ho_{18} is, therefore, rejected.

Teacher Questioning Behaviour and Pupil Achievement

Teacher behaviour of asking question has low correlation with pupil achievement in theory in the beginning of the session in both groups of pupils, while r value is negatively significant at .01 level in case of high SES pupils at the end of the session. The trend of negative correlations is discernible in pupil achievement in practical as well. The questioning behaviour is supposed to bring alertness among pupils but it is not reflected in their final achievement. It may be due to the fact that the questions asked in the classroom are very short answer type while in the examination, detailed explanation is required. However, in the classroom, oral answer with language defects and incomplete or partially correct answers are also accepted. If these structural defects are transferred to examination, the achievement score is bound to be adversely affected. Null hypothesis Ho_{19} (a) is, therefore, rejected. Null hypothesis Ho_{19} (b) cannot be rejected as correlational values are non significant.

Rosenshine (1976) and Jangira (1981) also report similar results with non significant correlations between incidental classroom questions and pupil achievement. The variations in response Patterns of pupils of high and low SES have been Pointed out by Gage and Berliner (1979)

Teacher Helping Behaviour and Pupil Achievement

Teacher Providing help to pupils does not exhibit any relation with their achievement as shown by very low correlation values. It raises a question about the quality of help provided by the teacher. Encouraging pupil behaviour has a positive correlation with pupils achievement in science in which most of the correlations are significant at.05 level. Null hypothesis Ho_{20} (b) is rejected while Ho_{20} (a) cannot be rejected. The results are in agreement with studies reviewed by Rosenshine (1976) and Flander (1970).

Teacher Supervision and pupils Achievement

Teacher supervision covering supervision of seatwork and corrective feedback have been discussed here in relation to pupil achievement. supervising seatwork shows negative correlation significant at.05 level with pupil achievement towards the end of the session for both groups of pupils. In case of achievement in practical, both groups indicate correlation significant at .05 level in the beginning of the session with a declining trend in r value towards the end. It implies that more supervision in practical where pupils handle material and do things themselves help pupils in their achievement. Research is quite clear that teacher time spent on supervision of seatwork is more effective in promoting achievement. Null hypothesis Ho_{21} (a) is, therefore, rejected. The finding is supported by Medley (1977) and Rosenshine (1980). It is further correlated by the observation that pupils working independently without adult supervision spend less time working with their material (Rosenshine, 1979) and so achieve less.

Corrective feedback is positively correlated with pupil achievement in theory and is significant at. 01 level in both the groups of pupils towards the end of the session. Null hypothesis Ho_{21} (b) is, therefore, rejected. the finding is supported by Gellman, 1969: Anderson, 1971: Bloom, 1981: showed the feedback strategies have been found positively associated with student achievement. Response to questions with immediate teacher feedback is correlated with Pupil achievement (Bloom, 1976; Good and Grouws, 1977; Rosenshine, 1978).

Management Behaviour and Pupil Achievement

Teacher management behaviour has three specific behaviours, namely, management of disruptive behaviour, giving directions and interruption by outsider. These have been discussed here in relation to pupil achievement in theory, practical and total.

Management of disruptive behaviour had negative correlation significant at.05 level in the beginning with achievement of pupils in theory significant at. 01 and .05 level towards the end of the session in the case of high and low SES group of pupils respectively. The r values are negative in the beginning and positive towards the end of the session. It may be due to the fact that pupils remain inattentive in the beginning while towards the end, the attention behaviour increases. Null hypothesis Ho_{22} (a) is, therefor, rejected. Managerial ability of teacher are positively related to pupil achievement (Good and Grouws, 1977). Teacher knowledge of behavioural management produced higher achievement (Cantrell, Stennes and Katzenmeyer, 1977). Minimum disruption leads to maximum pupil task involvement (Kounin, 1970; Brophy & Putam. 1974).

Giving directions indicates positive correlations with pupils achievement without reaching significance. It is an indicative of the trend that pupil achievement is influenced by teacher

directions, specially towards the end of the session. The examination orientation of teacher behaviour may focus on specific subject matter towards the end of the session. Null hypothesis HO_{22} (b) and (c) are, therefore, cannot be rejected.

Teacher behaviour seems to contribute to a reasonable extent in pupil achievement. The explanation behaviour shows high positive correlations excapt that teacher writing on blackboard is adversely related to their achievement. Question behaviour of teacher shows contradictory correlation while after asking questions, when teacher gives enough chance to pupils for response, seems to have contributing effect on pupil achievement. Other teacher behaviours like helping pupils, supervision and management behaviour show more or less adding adequately to their achievement gain. The findings are in support of the earlier researches conducted in this area.

Concomitant Variables: Correlational Results

Correlation among concomitant variables relating to pupil classroom learning behaviour and teacher behaviour correlations are presented in this section.

Correlation between pupil classroom learning behaviour having seven areas, namely, attention, response, seatwork, soliciting teacher help, pupil-pupil interaction, pupil helping teacher and classroom managerial activity, and teacher behaviour categorised into five areas, namely, explanation, questioning, helping, supervision and management are presented in Table 3.4

An examination of the table reveals that correlations among pupil attention behaviour asking teacher explanation (plan) as well as explanation (need), are significant at.01 level in respect of both high and low SES groups at the beginning as well as end of the session observations. The r values tends to increase towards the end of the session in case of high and low

CORRELATION BETWEEN PUPIL CLASSROOM LEARNING BEHAVIOUR AND TEACHER BEHAVIOUR

PCLB		Helping				Supervision				Management					
		PHP		EP		SSW		CFB		MDB		GD		IO	
		SES(H)	SES(L)	SES(H)	SES(L)	SES(H)	SES(L)	SES(H)	SES(L)	SES(H)	SES(L)	SES(H)	SES(L)	SES(H)	SES(L)
LA	BSL	-.05	-.05	.19	.21*	-.37**	-.34*	-.58**	-.50**	-.15	-.12	-.62**	-.58**	.41**	.36**
	ESL	-.27*	-.19	.02	-.06	-.67**	-.60**	-.17	-.37**	.09	.26*	-.32*	-.35**	.01	.10
LF	BSL	.26*	.06	-.09	.02	-.02	-.17	-.06	-.02	.18	.04	-.12	-.09	.38**	-.16
	ESL	-.05	.06	-.06	-.08	-.18	-.05	-.09	-.04	.68**	-.06	-.15	-.09	-.05	-.01
LD	BSL	.02	-.21*	-.16	.04	.07	-.01	.50**	.36**	.14	-.15	.45**	.50**	-.16	-.16
	ESL	-.18	-.17	-.25*	-.17	.24*	.20	-.13	-.19	-.01	-.06	.13	.16	.36**	.21*
IDB	BSL	.16	.06	.06	.09	-.07	.10	-.14	-.31*	-.07	-.11	-.31*	-.14	-.14	-.10
	ESL	.08	.09	-.07	-.09	.12	.13	.06	-.02	-.06	-.07	-.08	-.04	-.02	-.07
VR	BSL	.46**	-.04	-.12	-.03	.27*	.07	.02	-.08	-.11	-.08	-.19	-.24*	-.12	-.05
	ESL	-.10	.13	-.10	.16	-.28*	-.15	.03	-.04	.44**	.01	-.15	.10	-.08	-.22*
VI	BSL	.04	.04	-.12	-.18	.10	-.05	-.06	-.18	.25*	.11	-.07	-.17	.46**	.55**
	ESL	-.09	-.08	-.08	-.07	-.17	-.08	.37**	.22*	-.04	.00	-.07	.03	-.01	-.05
DR	BSL	.05	.19	-.02	.06	-.05	.23*	.06	.06	-.07	.07	.07	-.28*	-.07	.52**
	ESL														

SES pupils as a whole as well as separately. The r value is higher in the case of high SES Pupils than low SES pupils in the beginning as well as towards the end of the session.

Looking fatigued is negatively related to attention as prolonged attention behaviour leads to fatigue. Looking distracted behaviour of pupils also follow the same trend. Involvement in disruptive behaviour has low correlation showing a gradual negative increase towards the end of the session. It indicates that both the groups of pupils exhibit more attentive behaviour at the end of the session. Listening attentively is also positively related to explanation need which implies explanation by way of clarification.

The correlation between pupil attentive behaviour and teachers writhing on blackboard, are significant at.01 level in the beginning of the session for both the groups of pupils. It tends to decline towards the end of the session, probably due to revision of the courses. The differential results for high and low SES groups of pupils indicate that correlation between the two variables is higher in high SES group on both occasions than in low SES group. However, the decrease in the magnitude of correlation shows higher decline in high SES group of pupils towrards end of the sesion than in low SES puipls. Probably it may be because of the fact that unit is being revised by the teacher in the end of session and thus pupils feel that in has already been covered.

pupils fatigue and involvement in disruptive behaviour have negligibly small correlational values with blackboard writing. Blackboard writing has significant negative correlation with pupil distraction. The correlation value decreases in high SES pupils and show much increase in low SES pupils towards the end of the session. It shows that pupil distraction is maximum when teacher writes on blackboard and it decreases, in the case of high SES pupils and increases in the case of low SES pupils towards the end of the session.

Pupils Attention Behaviour and Teacher Questioning Behaviour

The table reveals that listening attentively and teacher questioning behaviour show high positive correlation in both the groups of pupils. It shows increase in r value towards the end of the session. Differentially, high SES pupils show more attentiveness towards teacher question at the end of the session as compared to low SES pupils whose attention level increases very little.

Fatigue and distraction behaviours have negative correlation with teacher questioning behaviour in case of both groups of pupils. A trend of progressive increase in negative r value is discernible in the case of pupils with low SES This may be due to the expectancy formed in the pupils as teachers tend to designate pupils from high SES group for responding more often than low SES ones. Negligibly small correlations have appeared in the case of disruptive pupil behaviour and teacher questioning, because questioning makes pupils alert and increase pupil participation. As a consequence the disruptive behaviour tends to decline.

Pupil attention behaviour has shown negative low correlation with teacher listening to pupil response in the beginning but have significant and positive correlation towards the end of the session. The trend is the same for both the groups of pupils. A comparison of the two groups indicate that correlations are higher in the case of low SES pupils. This, probably, may be due to the reason that low SES pupils feel that they can benefit from other pupil responses which may not be the case with high SES pupils, Looking fatigued has shown negative correlation at the beginning of the session which increases the positive value of r towards the end of the session in high SES group. It implies that high SES pupils do not listen to other pupil responses in the beginning of session, probably because they feel that they know better than others. In case of low SES pupils, correlations are negative and low and show decrease in r value following the pattern to a lesser extent in comparison of high SES pupils.

Pupil attention Behaviour and Teacher Helping Behaviour

Listening attentively behaviour of pupils has low negative correlation with teacher Providing help to others. High SES pupils exhibit low negative correlation in the beginning of the session but towards the need of the session the correlation becomes significant at .05 level in the same direction in both the groups. In the case of low SES pupils, decline in r value is less than in that of high SES pupils. However, r value tends to decline in both the cases towards the end of the session. It implies that, where pupils are attentive, they do not require teachers help. It so happens more in the case of high SES pupils than low SES pupils because high SES pupils seem to have more confidence and want to work independently. Other attention behaviours of pupils exhibit negligibly low correlation with teacher providing help.

Attentive listening behaviour of pupils has positive correlation with encouraging people behaviour of the teacher. The correlation is positive without reaching significance in high SES group while it is significant at .05 level in the case of low SES group, in the beginning of the session. The r value shows sizeable decrease towards the end of the session. the decrease might be due to revision exercises or more of seatwork for practice. Other attention behaviour of pupils do not exhibit any relationship with encouragement as the correlation values are negligibly small.

Pupil Attention Behaviour and teacher Supervision

Listening attentively has high negative correlations with teacher supervision of seatwork on both the occasions in both the groups of pupils. The increase in r value is more in the case of high SES pupils towards the end of the session as compared to low SES pupils. It implies that attention and supervision of seatwork shows an opposite relationship. Other attention behaviours too do not appear to be related to this teacher

behaviour variable. pupil attention behaviour and corrective feedback have yielded negative correlations with increasing trend towards the end of the session. The increase in r value is more in the case of high SES pupils as compared to low SES pupils. This appears to be due to non-verbal feedback provided by writing in the pupils note books.

Pupil Attention and Teacher Management Behaviour

Pupil attention indicates low correlation with management of disruptive behaviour which implies that they do not have any relationship except that high SES pupils get fatigued at the end of the session and need management behaviour as they tend to become inattentive. Listening attentively has high negative correlation with teacher giving directions on both the occasions for both the groups of pupils, which implies that teacher directions are either not very important or have assumed semblance of mannerism. They are also mostly non-academic. Pupil attention is positively related to interruption by outsider which implies that the pupils become conscious of the interruption due to high attention level at the end of the session, the correlation demonstrates a declining trend probably due to seriousness arising from examination onset. Doyle (1979) pointed out that students are the primary source of distraction because lack of cooperation in the activity on the part of students would obviously cause more interruption and distraction during the activity (Behnke et. al., (1981)

Pupil Response Behaviour and Teacher Explanation

Volunteer response and volunteer ideas of pupils have negative correlation with teacher explanation (plan) in the beginning of the session while it increases and becomes positive and significant ($p < .05$ to $.01$) towards the end of the session in both the groups. It may be inferred that on account of new content, pupils gave less response in the beginning but later on when they developed understanding, they started responding.

The pupil behaviour of not giving response have low negative correlations with teacher's explaining behaviour. The relation ship between voluntary response and explanation need follows the same trend as that of volunteer response and explanation plan. Volunteering response of pupils in the beginning of the session shows positive correlation significant at .01 and .05 level with teachers writhing on blackboard but it declines towards the end to the session. In the beginning of the session correlation between the question behaviour of teacher and volunteer response of pupils is higher. Both groups appear to be more interested and more attentive towards blackboard work when the content is taught for the first time. The r value decreases towards the end of the session probably due to the revision of course.

In the beginning of the session too, high SES pupils behaviour of volunteer ideas is positively correlated with blackboard writing, which further increases and attains significance at .05 level towards the end of the session. In case of low SES pupils the correlation values are just the reverse.

Teacher handling of material shows positive correlation significant at.01 level with pupils volunteer response and volunteer ideas in the beginning of the session in both the groups. The r value shows decline towards the end of the session. May be pupil response behaviour increases with corresponding increase of demonstration by teachers as is evident by decreasing value of correlations towards the end of the session observation.

Pupil Response Behaviour and Teacher Question Behaviour

The table reveals that in the case of high SES group volunteer response behaviour of pupils has positive correlation with teacher asking question behaviour significant at .01 level. It further indicates decline towards the end of the session and

reaches a significant level of .05. The results are just opposite in the case of teacher asking questions and pupil volinteering ideas in the case of high SES pupils at the end of the session and of the session and low SES pupils in the beginning of the session observations.

Pupil Response and Teacher Helping Behaviour

Voluntary response has positive correlation significant at .01 level with teacher behaviour of providing help to pupils in the beginning of the session in case of high SES pupils. Higher r value in the case of high SES pupils may be due to the fact that they get more help the teacher in the beginning of the session as compared to low SES pupils.

Pupils Response and Teacher Supervision

In case of high SES group pupil volunteer responses exhibit Positive correlation significant at.05 level with teacher supervision of seatwork in the beginning of the session and negative correlation significant at .05 level towards the end of the session. It may be because of the fact that they want to work independently towards the end of the session for revision pupils volunteer ideas has positve corllelation (significant at.01 and .05 level) with corrective feedback towards the end of the session in high and low SES groups respectively. It may be due to the reason that teacher supervision which is generally more toward end of the session increase pupils response behaviour.

Pupils Response and Teacher Management of Disruptive Behaviour

Pupils voluntary response behaviour with teachers management of disruptive behaviour has positive correlation significant at .01 level at the end of the session in case of high SES pupils. It implies that at times disruption is caused by

number of volunteer response at the end of the session. If most of the pupils want to give the response, it will be natural that the class will be disrupted and teachers will have to manage it. Volunteer ideas too are, positively correlated reaching significance level of .01 with interruption of the class as most pupils would like to respond to the enquiry by outsider.

Pupils Seatwork and Teacher Explanation

Pupils being busy in seatwork, the teacher explanation (plan) occur comparatively less as is revealed by negative and low values of correlations. A similar trend is discernible in other explanation behaviours like explanation need, writing on blackboard and handling of material with pupil seatwork behaviour on both the occasions. Pupils involved in writing show negative correlations significant at .05 level in the beginning and at .01 level at the end of the session with explanation (plan) in both groups of pupils.

Seatwork and Teacher Questioning

Seatwork shows positive correlation significant at .05 level with teacher questioning behaviour in the beginning of the session and a decline in `r' values in all the specific behaviours towards the end of the session. It may be because in the beginning when new content unit is taught, more questions are asked, but towards the end when revision starts, the frequency of questions by teacher also decreases.

Pupil Seatwork and Teacher Helping Behaviour

Pretending to read book shows positive correlations with providing help behaviour significant at .01 level in the beginning of the session whereas involvement in writing shows positive correlations significant at .05 level towards the end of the session in respect of both the groups. It may be inferred that

providing help reduces the chance of reading the book at the beginning of the session while it increases involvement in writing towards the end of the session in both the groups as they prepare notes for examination towards the end of the session. Reading book attentively has high positive correlation with teacher encouraging pupil significant at .01 level on both the occasions in both the groups of pupils. The `r' value though remains significant at .01 level decreases towards the end of the session. However, it remains high in the case of high SES pupils. It implies that teacher encouragement motivates both the groups for book reading but the effect is better in the case of high SES pupils and more so in the beginning as compared to the end of the session. The result shows that teacher encouragement is positively related to pupils seatwork behaviour.

The behaviour of copying from the blackboard has positive correlation with teachers encouraging behaviour significant at .01 and .05 level in the beginning and end of the session in case of low SES pupils respectively. The `r' value declines reaching very low at the end of the session. Towards the end, both the groups do not show interest in writing work which is evident from high and significant correlation values.

Reading the book in classroom by pupils show negative correlation with corrective feedback significant at .05 level on both occasions in respect of both the groups. It may be that these factors have contrary effects on each other. Pupils involvement in writing correlation is positively correlated with teacher supervision ($p < .01$) towards the end of the session in the case of both the groups of pupils. The copying from blackboard too exhibits correlation significant at .01 level and .05 level in the beginning in case of high and low SES groups of pupils with a declining trend towards the end of the session. Involved in writing behaviour of pupils is positively correlated with corrective feedback ($p < .05$) in the beginning of the session while at the end, `r' value is very low for both the groups of pupils.

Pupils Seatwork and Teacher Management Behaviour

Involvement in writing by pupils is positively correlated with management of disruptive behaviour in the beginning. The `r' value becomes negative towards the end of the session in the case of both the groups. It may imply that management problems encountered in the beginning reduce towards the end of the session when more seatwork is given to pupils for both the groups of pupils.

Teacher directions are positively related with writing behaviour of pupils significance level of .01 in respect of both the groups on both the occasions, but there is an indication declining `r' value towards the end of the session. Writing towards the end also is done for revision which does require comparatively less directions.

Pupil Soliciting Teacher Help and Teacher Explanation

Pupil reaching teacher for removing difficulties show negative correlations with explanation plan significant at .05 level in case of high SES pupils in the beginning of the session whereas `r' value decrease and show negative correlation significant at .05 level in case of low SES pupils towards the end of the session. Clarifying doubts has low positive correlation with explanation need in the beginning and show increasing trend towards the end of the session reaching significance level of .05 in both the groups of pupils. The `r' value is high in case of high SES pupils which shows that clarifications taken in are more understood by pupil at the end of the session than the beginning but more so in case of high SES pupils. Writing on blackboard and handling of materials shows very low correlations with soliciting teacher help.

Pupil Soliciting Teacher Help and Teacher Questioning

Pupil reaches teacher for removing difficulties and clarifying doubts indicate very low negative correlations with teacher asking questions. Teacher listening to pupil response is positively correlated with removing difficulties by pupil, reaching significance level in the beginning of the session in case of both the groups of pupils. Clarifying doubts too has positive correlation with questioning behaviour in the beginning without reaching significance. The `r' value shows decline towards the end and negative correlation significant at .05 level at the end of the session in case of low SES pupils is exhibited.

Pupils Soliciting Teacher Help and Teacher Helping Behaviour

Pupils reaching teacher for removing difficulties for completing seatwork and for clarifying doubts, all have positive correlations with teacher helping behaviour significant at .01 level towards the end of the session but have negative and low `r' value in the beginning for both groups of pupils.

Pupils Soliciting Teacher Help and Teacher Supervision

Supervising seatwork is positively correlated with pupils reaching teacher for removing difficulties significant at .05 level on both occasions in both the groups of pupils. The `r' value decreases in the case of high SES and show increase in the case of low SES group of pupils. It infers that high SES pupils clarify more doubts and difficulties. Corrective feedback behaviour follows the same trend as supervising seatwork. Management of disruptive behaviour is positively correlated with supervising seatwork and corrective feedback significant at .05 level in the beginning of the session in the case of both the groups of pupils while this behaviour does not exist towards the end of the session. It may probably be due to the increasing seriousness among pupils with the approaching examinations.

Pupils Soliciting Teacher Help and Teacher Management

Management of classroom is purely done by the teacher depending of the circumstances and classroom environment and teacher does not like any type of involvement in his management behaviour from pupils. It is also revealed by data here as they show negligibly low correlations.

Pupil-Pupil Interaction and Teacher Explanation

Discussing a point among pupils themselves has negative correlation with explanation plan significant at .05 level in the beginning of session while `r' value increases in negative direction towards the end of the session reaching significant level .01 for both the groups of pupils. It reflects that the discussion among the pupils and teacher explanation plan are two different behaviours. When teacher explains, he will make sure that pupils listen to him and do not discuss among themselves. The same trend was discerned in teacher explanation need. Teacher clarifying doubts of pupils by explaining need is negatively correlated ($p < .05$ to .01) in the case of low SES group of pupils in the beginning and end of the session respectively.

Writing on blackboard has negative correlation with discussing a point significant at .05 level, which in the case of low SES pupils increases towards the end of the session reaching significance level of .01 while high SES pupils have positive correlation significant at .05 level declining towards the end of the session. It means high SES pupils have tendency to discuss among other pupils when teacher writes on blackboard which is reduced towards the end.

Handling of material is positively correlated with discussing a point significant at .05 level in the beginning of session in both the groups while `r' value declines remaining significant at .05 level in the case of high SES group. It, however, declines to a

greater extent attaining even negative low value towards end of the session in the case of low SES group.

Giving help has positive correlation with explain need significant at .05 level in case of high SES pupils in the beginning. It, however, shows decline towards the end whereas low SES pupils have negligibly low correlations. It shows that only high SES pupils take interest in helping other pupils when teacher is explaining (need) in the beginning as they might be having comparatively better understanding. But it is less at the end of the session when others too have come to the same level of understanding. However, low SES pupils exhibit less tendency to help others. High SES pupils at the end and low SES pupils in the beginning show positive correlations between giving help and handling of material significant at .01 level.

Pupil-Pupil Interaction and Teacher Questioning Behaviour

Teacher questions do not let the pupils feel the need of interaction, so is shown here by the data as they show very low or negative correlations between discussing a point and teacher questioning. Listening to other pupil response is negatively correlated with discussing a point significant at .05 level in case of high SES pupils. It can be inferred that the pupils discuss to find out the correct reply if a wrong reply is given by a pupil to teacher questions. Differentially, it is more so in the case of low SES pupils than in high SES group of pupils. Giving help also exhibits positive correlation with listening to pupil response ($p < .05$) in the beginning of the session in the case of high SES group of pupils while accepting help shows correlations significant at .05 level in the beginning of the session in case of both the groups of pupils.

Pupil-Pupil Interaction and teacher Helping Behaviour

Discussing a point is positively correlated with providing help significant at .01 level towards the end of the session, in

case of high SES pupils while low SES pupils correlation is positive and show decline as `r' value is negative towards the end of the session. The pupils discussing a point need a lot of help of the teacher as he directs them on right lines but such discussions are less in low SES pupils as compared to high SES pupils towards the end of the session. Teacher help and pupils' mutual help go together and increases at the end of the session, more so, in case of high SES pupils.

Pupil-Pupil Interaction and Teacher Supervision

Discussing a point is positively correlated with supervising seatwork and giving help significant at .05 level which increases and is significant at .01 level towards the end of the session in both the groups of pupils. It shows that when teacher supervises seatwork, pupils indulge in discussion, give help and accept help in the beginning of the session in both the types of groups. The help is generally provided more by high SES pupils.

Corrective feedback shows positive correlations with discussing a point reaching significance levels of .05 and .01 in the beginning of the session in the case of high and low SES groups of pupils respectively, which shows decline in `r' value towards the end infer that they accept corrective feedback easily in the beginning during discussions, while towards the end they do so as to a less extent. Giving help and accepting help also have positive significant correlations.

Pupil-Pupil Interaction and Management

Management of disruptive behaviour has positive correlation with giving help and accepting help significant at .05 and .01 levels in case of high SES pupils in the beginning session. The low SES pupils too show significant correlation with accepting help in the beginning of the session. It shows that mutual exchange of help among pupils causes more disruption in the

beginning than at the end in both the groups of pupils. During that process they develop working norms. Directions by teacher too have significant correlation in the case of low SES pupils on both occasions with increasing `r' value towards the end of the session which shows that the teacher has perforce to direct the pupils not to involve in discussion. Differentially it is more so in case of low SES pupils when compared to high SES pupils which shows gradual increase towards the end of the session. Probably, it may be so due to the reason that pupils like discussion more at the end of the session for better understanding.

Pupil Helping Teacher and Teacher Behaviour

Helping teacher in handling material shows positive correlations with teacher explanation plan, explanation need, writing on blackboard, handling material and teacher asking questions significant at :05 level in the case of high SES pupils in the beginning of the session. It reveals that teacher selects comparatively more pupils from high SES group for help while demonstrating.

The pupil behaviour of helping teacher on blackboard shows negative correlation with teacher explanation plan and explanation need significant at .05 level at the end of the session in the case of low SES group of pupils and in the beginning in the case of high SES pupils respectively. The correlation values are positive and significant at .01 to .05 level in case of teacher questioning behaviour, listening to pupil response behaviour, providing help to pupil, supervising seatwork and corrective feedback behaviour of teacher. It reveals that by extending more help to teacher on blackboard makes him more familiar to the teacher, he will ask him more questions, will provide more help, more supervision and corrective feedback irrespective of his SES group.

Classroom Managerial Activities and Teacher Behaviour

The teacher directed activities shows negative correlation with teacher behaviour with respect to explanation, questioning and supervision behaviour significant at .05 to .01 levels, but the classroom management behaviour and the teacher directing behaviour show positive correlations significance level (.05 to .01) which is but natural as both are similar teacher behaviours.

About self directed activities of pupil, the teacher explanation behaviour shows negative correlations, which is because the pupils do not receive what teacher intends to do. It is more so in case when teacher explains (need) because the need belongs to a particular pupil while others do not pay attention. Listening to other pupil response is positively correlated with self directed activity significant at .01 level on both occasions in both the groups of pupils. It shows that when other pupils give response, the pupils get busy in their self directed activities. It is so in both the groups of pupils on both occasions.

The pupil classroom learning behaviours and teacher behaviour correlations when viewed can give a lot of information about the classroom transactions. The pupil attention behaviour shows high correlations with teacher behaviours while the inattention behaviours shows negative correlations. Pupil response behaviour depends a lot on teacher behaviour as revealed by correlations presented in Table 3.4. Pupil seatwork behaviour again shows positive high correlations with teacher behaviour as it is generally originated by teacher only. Soliciting teacher help is a pupil behaviour and teacher helps the individual whosoever reaches him. This too has shown a general positive trend in `r' value. Pupil-pupil interaction correlations with teacher behaviour are specific and positively significant in case of discussing a point as discussion leads to more classroom transactions and develops better understanding if controlled by the teacher. Pupil helping teacher behaviours occur rarely.

Classroom managerial activities with respect to teacher directed and self directed activities show high and positive correlation values as the pupils are generally directed by teacher or they are left to do the work on their own.

Prediction Results

In order to achieve objective number 23 of the study, the data were analysed for prediction of pupils achievement in science from variables relating to PCLB, POSARE, and teacher behaviours. In other words, pupils achievement in science theory, practical and total formed the set of criterion variables. Their prediction using regression was carried out separately. The sets of pupil learning behaviour, pupil out-of-school achievement related efforts and teacher behaviour constitute the sets of predictor variables. Prediction was carried out separately for high SES and low SES group of pupils. Tables 3.5 to 3.10 present results of stepwise regression analysis. The tables provide value of multiple R, R square, RSQ change and corresponding F-values.

High SES Pupils Total Achievement

Table 3.5 provides prediction results in respect of the pupil achievement in science total (theory and practical) aggregate for high SES group of pupils. The significance value for RSQ change with degree of freedom 1 and 39, that is, F-value are 4.6 and 7.23 at .05 and .01 levels respectively.

It will be seen from the Table that corrective feedback has emerged as the first predictor variable followed by teacher directed activity.

TABLE 3.5

Prediction results in respect of pupil achievement in science for high SES pupils

S. No.	Behaviour Description	Multiple R	R Squre	RSQ Change	F-Value
1.	Corrective feedback	.35687	.12879	.12879	5.618*
2.	Teacher directed activity	.47924	.22967	.10080	4.846*
3.	Teacher asks question	.51717	.26746	.03779	1.857
4.	Hobbies time	.55732	.3107	.04314	2.190
5.	Newspaper & magazine study working day	.59784	.35741	.04681	2.457
6.	Listening attentively	.62527	.39096	.03355	1.818
7.	Self directed activity	.65325	.42673	.03577	1.997
8.	Looking Fatigued	.67629	.43737	.03064	1.750
9.	Pretending to read book	.69623	.48764	.02737	1.594
10.	Gives direction	.71267	.50790	.02316	1.365
11.	Supervising seatwork	.72816	.53022	.02232	1.330
12.	Teacher explains plan	.73983	.54735	.01713	1.022
13.	Discussing a point	.75438	.56909	.02274	1.312
14.	Curricular Study Working day	.77235	.59652	.02743	1.690
15.	Listening to pupil response	.79839	.63757	.04104	1.718

*Significant at .05 level.

The corrective feedback explains 12.9 percent of the variance in pupils' total achievement in science is a teacher behaviour variable. The second predictor is out of pupil classroom learning behaviour variables, that is, teacher directed activities which contribute 10.1 percent to the variance in achievement explained. Both the variables which are significant at .05 level combine together to explain 22.9 percent of variance in pupils achievement of high SES pupils.

The third predictor variable is teacher asking question which explains 3.8 percent of variance in pupils achievement. Times spent on hobbies by the pupils and their reading newspaper and magazine on a working day and some other pupil behaviour from serial 4 to 9 in Table 3.5 show a contribution of 21.7 percent to variance in pupil achievement. Teacher gives direction, supervision of seatwork and explains plan contributes further 5.2 percent of variance in pupils achievement.

A significant point emerging from the analysis is that teacher behaviour emerges as the dominant predictor of the pupil achievement instead of pupil behaviours. The first predictor which has achieved significant F-value at .05 level is teacher behaviour. The total variance in pupil achievement explained by teacher behaviour comes to 28.1 percent while total experience explained by PCLB and POSARE have been able to explain variance in pupils achievement to the tune of 23.9 percent and 11.5 percent respectively out of total variance 63.7 percent explained by 15 variables.

High SES Pupils Achievement in Science Theory

Prediction results in respect of pupil achievement in science theory for high SES group are presented in Table 3.6. Corrective feedback and teacher asking questions have emerged as the two significant predictors, the former explaining a variance of 16.8 percent and the latter explaining a variance of 7.7. percent in pupil achievement in science theory. Both predictors explain 24.5 percent of the variance. The pupil variables appear third step onwards, but the predictors are not significant. An overview of the Table indicates that out of total variance 65.1 percent explained by 15 variables, the teacher behaviour, PCLB and POSARE, explain 32.0 percent, 23.3 percent and 9.9 percent of variance respectively. Obviously teacher behaviour emerges as major factor influencing pupils achievement in science theory.

Table 3.6

prediction result in respect of pupil achievement in science theory for high SES pupils

S. No.	Behaviour Description	Multiple R	R Squre	RSQ Change	F-Value
1.	Corrective feedback	.40948	.16767	.16767	7.655**
2.	Teacher asks questions	.49498	.24500	.07733	4.753*
3.	Self directed activity	.53179	.28281	.03781	1.898
4.	Gives direction	.56552	.31982	.3701	1.904
5.	Listening attentively	.63479	.40296	.03314	1.904
6.	Looking fatigued	.65698	.43163	.02867	1.664
7.	Hobbies time	.68368	.46741	.03578	2.166
8.	Teaching aid preparation time	.70866	.50219	.03478	2.166
9.	Pretending to read book	.73725	.54353	.04134	1.717
10.	Reaches teacher for removing difficulties	.74907	.56111	.0175	1.161
11.	Newspaper and magazine study time on a working day	.75758	.57393	.01282	.842
12.	Supervising seatwork	.76911	.59154	.01761	1.164
13.	Library time on a working day	.77903	.60692	.01538	1.017
14.	Teacher explains plan	.74194	.62717	.02025	1.358
15.	Discussing a point	.80694	.65114	.2397	1.649

*Significant at .05 level

**Significant at .01 level

High SES Pupil Achievement in Science Practical

Table 3.7 provides prediction results in respect of pupil achievement in science practical for high SES pupils. It can be seen in the Table that the first predictor is pupil classroom learning behaviour of being involved in writing, explaining 20.98 percent of the variance in pupil achievement in science practical with an F-value significant at .01 level. It is followed by teacher directed activity contributing 20.8 percent of variance explained in pupil achievement in practical. The other three significant predictors relate to the pupil time devoted to home task on working day; the time devoted on hobbies and curricular study time on a working day, explaining 3.5 percent, 3.8 percent and 5.6 percent of variance. Looking fatigued pupil behaviour which appears at 9th position in significant predictor. Other variables show non-significant values. An overview of the Table indicates that out of total 79.6 percent variance explained, the most dominant predictors are PCLB such as, involved in writing, teacher directed activity, discussing a point etc. contributing about 54.7 percent of variance followed by POSARE which explains 18.3 percent of variance showing home task, hobbies and curricular study time as significant predictor followed by teacher behaviour explaining 6.6 percent of variance

Table 3.7

prediction results respect of pupil achievement in science practical for high SES pupils

S. No.	Behaviour Description	Multiple R	R Squre	RSQ Change	F-Value
1.	Involved in writing	.45803	.20980	.20980	10.89**
2.	Teacher directed activity	.64689	.41847	.20867	13.277**
3.	Home Task time working day	.67323	.45324	.03477	4.489*
4.	Hobbies time	.70102	.49142	.03818	4.804*
5.	Curricular study time working day	.73985	.54738	.05566	4.203*
6.	Discussing a point	.77836	.60584	.05846	2.289*
7.	Teacher explain	.79092	.62556	.01972	1.685
8.	Encourages pupil	.80045	.64072	.01516	1.308
9.	Looking fatigued	.82160	.67592	.03430	3.167*
10.	Supervising seatwork	.83152	.69142	.01640	1.542
11.	Listens to pupils response	.83945	.70451	.01309	1.240
12.	Curricular study vacation day	.84943	.72153	.01702	1.650
13.	Non-curricular study working day	.85967	.73903	.01750	1.7442
14.	Newspaper and magazine study vacation day	.87109	.75879	.01976	2.047
15.	Self directed activity	.89231	.709622	.03743	2.628

*Significant at .05 level
** Significant at .01 level

In the prediction of pupils achievement in science practical pupil classroom learning behaviour seems to play a dominant role, while in theory it was observed that teacher behaviour seems to

play a dominant role. It may be recalled that it ws pointed out while explaining correltional results that the pupils' home work and involved in writing are specific in the case of practicals achievement. Hobbies themselves being practical contribute to achievement in science practical.

Low SES pupils and Total Achievement in Science

Prediction results in respect of pupil achievement in science for the low SES pupils are given in Table 3.8. It can be seen from the Table that pupils time devoted to hobbies, reading of newspaper and magazine emerge as the first two variables explaining 30.3 percent of variance in pupils achievement with F-value significant at .01 and .05 level respectively. The third significant predictor being teacher behaviour, that is, corrective feedback contribute 5.4 percent of variance explained. Further the time devoted to the help received from the parents, tutor or both at home is a significant predictor in their achievement contributing 7.9 percent of variance. The fact that the pupil achievement is predicted mainly by time devoted to POSAR activities by the pupils is distinctly different from the predictors of achievement in science for the high SES group of pupils. Here most dominant contributor to achievement is time devoted to out-of-school achievement related activity has been able to explain 51.5 percent of variance in pupil achievement, while in the high SES group these predictors explained 11.5 percent of variance. Similarly teacher behaviour contributed 28.1 percent of variance in high SES group and 15.4 percent in low SES group of pupils in science achievement, PCLB contributes 23.9 percent of variance on achievement in case of high SES group while 9.6 percent of variance is shown in the case of low SES pupils achievement. High SES group explain 63.7 percent while low SES explains 76.6 percent of total variance by 15 variables. The reason can be the motivational level of low SES pupils where drop-out is heavy at early stage. Only the motivated survive. In the case of high SES, surviving rate is comparatively higher and even indifferent and unmotivated also survive. Chopra (1964) found that ninety six percent of students who discontinued education did due to poor economic conditions of the family, gets a support from this finding of this study.

Table 3.8

prediction results in respect of pupil achievement in science for low SES pupils

S. No.	Behaviour Description	Multiple R	R Squre	RSQ Change	F-Value
1.	Hobbies Time	.46646	.22701	.22701	11.160**
2.	Newspaper and magazine study working day	.55056	.30312	.07611	4.041*
3.	Corrective feedback	.60629	.36759	.05447	4.070*
4.	Help received	.66833	.44653	.07894	4.992*
5.	Volunteers ideas	.69220	.47914	.03261	2.129
6.	Help teacher on blackboard	.70759	.52068	.02154	1.424
7.	Supervising seatwork	.73014	.53311	.03243	2.223
8.	Curricular study working day	.74638	.55708	.02397	1.678
9.	Reading book attentively	.78189	.61136	.05428	3.190*
10.	Providing help to pupil	.80327	.64525	.03389	2.777*
11.	Non-curricular study working day	.82183	.67541	.03016	2.601*
12.	Teaching aid preparation	.83851	.70310	.02769	2.519*
13.	Involved in writing	.85030	.72301	.01991	1.869
14.	Co-curricular activity	.86373	.74603	.02302	2.266*
15.	Library study time working day	.87500	.76562	.01959	2.006

*Significant at .05 level
**Significant at .01 level

Low SES Pupils Achievement in Science Theory

Prediction result in respect of pupil achievement in science theory in case of low SES group pupils, are presented in Table 3.9. The fifteen predictor variable in the Table explain about

Table 3.9

prediction results in respect of pupil achievement in science theory for low SES pupils

S. No.	Behaviour Description	Multiple R	R Squre	RSQ Change	F-Value
1.	Hobbies time	.39979	.15983	.15983	8.229**
2.	Help received	.49778	.24779	.08796	7.361**
3.	Corrective feedback	.62415	.38956	.14177	4.327*
4.	Curricular study working day	.67076	.44991	.06035	4.301*
5.	Supervising seatwork	.69950	.48930	.03939	4.547*
6.	Volunteers ideas	.73199	.53381	.04451	3.306*
7.	Curricular study holiday	.75458	.56939	.03558	2.495*
8.	Co-curricular activities	.80580	.64331	.07992	3.840*
9.	Teacher explains plan	.81881	.67045	.02114	1.924
10.	Newspaper and magazine study vacation day	.84565	.71512	.04468	2.622*
11.	Self directed activity	.85602	.73378	.01766	1.850
12.	Involved in writing	.86635	.75056	.01778	1.925
13.	Newspaper and magazine study time holiday	.87335	.76274	.01218	1.334
14.	Teaching aid preparation	.88100	.77617	.01343	1.5002
15.	Home task time holiday	.89223	.79608	.01991	2.344*

* Significant at .05 level, ** Significant at .01 level

79.6 percent of variance of pupil achievement in theory. The first predictor comes out to be time pupil devote to hobbies explaining 16 percent of the variance with F-value significant at .01 level. It is followed by help received by pupil provided by parents, tutor or both, contributing 8.8 percent of the variance to pupil achievement in theory significant at .01 level. Corrective feedback given by teacher is another significant predictor contributing about 14.2 percent of variance with F-value significant at .05 level. Other significant predictors are the time devoted by the pupils to curricular study on a working day and teacher supervising seatwork which contributes 6.0 percent and 3.9 percent respectively. Pupils volunteer ideas and curricular study on a holiday being significant at .05 level contribute 4.4 and 3.5 percent respectively to variance explained. Newspaper and magazine study time devoted on a vacation day and home task time on a holiday are also significant predictors in theory achievement contributing 4.5 percent and 2.0 percent to variance respectively.

The prediction results of low SES pupils are completely in contrast to the prediction results of high SES group pupils. Here the predominant role is played by PCLB and POSARE variables. The time devoted by POSARE accounts for much more variance in pupil achievement in theory than even his classroom learning behaviour and classroom teacher behaviour. So, here POSARE contributes 52.3 percent, PCLB contributes 8.1 percent and teacher behaviour contributes 19.2 percent of variance out of 79.6 percent of total variance explained by 15 variances towards low SES pupils achievement in theory.

Low SES Pupils Achievement in Science Practical

Prediction result in respect of pupil achievement in practical for low SES group of pupils presented in Table 3.10. The Table reveals 15 predictor variables explaining above 72.9 percent of the variance in pupil achievement in practical in the case of low

SES pupils. The first predictor comes out to be time devoted to hobbies which explains about 14.8 percent of variance with F-value significant at .05 level while second and third predictor are time devoted to reading newspaper and magazine study on a working day contribute 12.5 percent and curricular study on a working day contributing 9.4 percent of variance having F-value significant at .05 level. Other significant predictors are time devoted to teaching aid preparation contributing 5.2 percent, volunteer ideas contributing 6.5 percent, help teacher on blackboard contributes 4.7 percent, non-curricular study on a vacation day contributes 3.2 percent and curricular study on a working day contributes 3.5 percent of variance explained which are significant at .05 level.

Table 3.10

prediction results in respect of pupil achievement in science practical for low SES pupils

S. No.	Behaviour Description	Multiple R	R Squre	RSQ Change	F-Value
1.	Hobbies	.38476	.14804	.14804	6.603*
2.	Newspaper and magazine study working day	.52265	.27317	.12513	6.370*
3.	Curricular study working day	.60591	.36712	.09395	5.344*
4.	Teaching and preparation	.69647	.41968	.05256	4.318*
5.	Volunteers ideas	.64783	.48507	.06539	4.170*
6.	Help teacher on blackboard	.72274	.52236	.04729	2.576*
7.	Library study time working day	.74214	.55077	.02841	2.024

8. Reading book attentively	.77330	.59799	.01951	1.456
9. Providing help to pupil	.78359	.61402	.01703	1.204
10. Non-curricular study vacation day	.80393	.64630	.03228	2.556*
11. Curricular study holiday	.81250	.66016	.02386	1.101
12. Looking distracted	.81241	.67144	.1128	.892
13. Home task vacation day	.83280	.69355	.02211	1.804
14. Curricular study working day	.85415	.72957	.03502	3.197*

* Significant at .05 level
** Significant at .01 level

The PCLB explains total variance of 13.3 percent in low SES pupils achievement in science practical while POSARE contribute about 55.0 percent and teacher behaviour contributes about 4.5 percent of variance out of 72.9 percent total variance explained by 15 variables for their achievement in practical.

The contribution of out-of-school achievement related efforts which is 55.0 percent, is much more in case of low SES pupil achievement in science practical when compared to high SES group as their contribution of POSARE is just 18.5 percent of variance. In the case of PCLB and teacher behaviour they contribute less in low SES group when compared to high SES group for their achievement in science practical. It reveals that low SES pupils develop more skill by devoting more time on POSARE while high SES pupil may be making up by reading of understanding practical work before or while doing it.

From the discussion presented above, it is evidently clear that the high and low SES groups distinctly differ in their behaviours for the prediction. The out-of-school achievement related efforts of low SES pupils contribute more than fifty percent towards their achievement in science theory, practical and total. In the case of high SES pupils the achievement in practical is mainly predicted by pupil classroom learning behaviour, a little over fifty percent, while these contribute to a tune of 23 percent in their achievement in theory and total. Teacher behaviours have come out as major predictors ranging from 28 to 32 percent in high SES pupil achievement in science total and theory respectively. Hence the two groups distinctly differ in their prediction of achievement in science.

4

INFERENTIAL RESULTS

The preceding chapter presented correlational and prediction results. The present chapter provides inferential results wherein the hypotheses relating to comparing high and low SES pupils in respect of classroom learning behaviour POSARE and teacher behaviour have been tested using t-test of uncorrelated means. The Tables 4.1 to 4.5 provide the results emerging from the analysis. Each Table provides means, SDs, t-values and significance in respect of different variables.

Pupil Classroom Learning Behaviour

It may be recalled that 25 categories of classroom learning behaviour were divided into seven areas, namely, *attention, response, seatwork, soliciting teacher help, poor interaction, pupil helping teacher and managerial activities.* The frequency of occurence of the PCLB were converted into percentages. The means and SDs are computed with the percent occurence of these behaviours. The means and standard deviations in respect of the observations of the lessons in the beginning of the session and end of the session have been shown separately. Table 4.1 provides results relating to PCLB.

TABLE 4.1

MEANS, SDs AND t-VALUES OF HIGH AND LOW SES PUPIL CLASSROOM LEARNING BEHAVIOUR IN THE BEGINNING AND AT THE END OF THE SESSION OBSERVATION

S. No.	Pupil Classroom Learning Behaviour		Mean SES(H)	Mean SES(L)	S.D. SES(H)	S.D. SES(L)	t-value	Prob-ability
	Attention							
1.	Listening attentively	BSL	57.00	59.90	12.55	14.05	.70	.485
		ESL	51.60	52.48	13.13	15.50	-.25	.801
2.	Looking fatigued	BSL	0.46	0.35	1.59	0.70	.45	.652
		ESL	1.20	0.38	7.11	1.59	.73	.469
3.	Looking distracted	BSL	2.48	1.70	3.44	1.44	1.34	.187
		ESL	2.20	1.81	2.81	2.01	0.78	.439
4.	Involved in disruptive behaviour	BSL	0.54	0.55	1.26	1.01	0.00	1.000
		ESL	0.20	0.05	0.66	0.22	1.37	.176
	Volunteer responses/ideas							
5.	Volunteers response	BSL	1.26	0.90	1.39	0.99	1.34	.184
		ESL	1.20	0.62	1.71	0.68	2.19	.032*
6.	Volunteers ideas	BSL	0.44	0.25	0.78	0.40	1.62	.110
		ESL	1.30	0.01	7.10	0.08	1.20	.233
7.	Does not respond	BSL	0.16	0.06	0.80	0.21	.76	.449
		ESL	0.00	0.00	0.00	0.00	0.00	1.000

Seatwork

8. Reading book attentively	BSL	1.21	1.05	2.21	1.79	.38	.707
	ESL	4.30	4.05	7.03	7.90	.18	.958
9. Pretending to read the book	BSL	1.60	0.35	4.67	0.59	1.86	.070
	ESL	0.50	0.88	2.12	4.02	-0.45	.652
10. Involved in writing	BSL	25.06	29.25	11.90	12.11	-1.52	.132
	ESL	26.10	22.95	14.31	14.97	0.06	.952
11. Copying from blackboard	BSL	3.05	2.80	6.27	3.76	.24	.813
	ESL	1.72	2.01	4.08	3.01	-.30	.768
12. Evades seatwork	BSL	0.66	0.45	3.16	1.08	.47	.639
	ESL	0.00	0.00	0.00	0.00	0.00	1.000

Solicits teacher help

13. Reaches teacher for removing difficulties	BSL	0.21	0.05	0.64	0.11	1.83	.071
	ESL	0.30	0.21	0.85	0.97	.61	.541
14. For help to complete seatwork	BSL	0.00	0.00	0.00	0.00	0.00	1.000
	ESL	0.20	0.01	0.68	0.08	2.08	.041*
15. For clarifying doubts	BSL	0.06	0.20	0.28	0.61	.75	.465
	ESL	0.15	0.04	0.81	0.18	1.15	.254
16. Management of distruptive behaviour	BSL	0.11	0.00	0.46	0.00	1.55	.126
	ESL	0.01	0.00	0.08	0.00	1.00	.320
17. Waits for teacher help	BSL	0.00	0.00	0.00	0.00	0.00	1.000
	ESL	0.03	0.00	0.18	0.00	1.36	.179

Pupil-Pupil interaction

18. Discussing a point	BSL	1.08	0.22	2.78	0.64	1.89	.063
	ESL	0.20	0.25	0.60	0.83	-0.08	.938
19. Giving help	BSL	0.09	0.20	0.30	0.97	-.70	.486
	ESL	0.01	0.00	0.80	0.00	1.00	.320
20. Accepting help	BSL	0.01	0.08	0.08	0.24	-.156	.124
	ESL	0.00	0.00	0.00	0.00	0.00	1.000
21. Responding to pupil questions	BSL	0.00	0.01	0.00	0.08	-1.00	.320
	ESL	0.00	0.00	0.00	0.00	0.00	1.000
Helping teacher							
22. Help teacher in handling material	BSL	0.03	0.00	0.11	0.00	1.43	.156
	ESL	0.00	0.00	0.00	0.00	0.00	1.000
23. Help teacher on blackboard	BSL	0.03	0.21	0.16	0.29	-.99	.327
	ESL	0.08	0.09	0.27	0.08	1.42	.159
Managerial activities							
24. Teacher directed	BSL	1.42	2.86	2.72	2.26	-.66	.509
	ESL	4.30	7.30	3.12	8.24	.09	.960
25. Self directed	BSL	3.02	3.74	1.77	1.71	-.29	.783
	ESL	4.40	6.86	0.77	3.96	.88	.930

BSL : Beginning of session lesson
ESL : End of session lesson
SES(H): High Socio-Economic Status
SES(L): Low Socio-Economic Status
S.D. : Standard Deviation

Pupil Attention

It can be seen that the pupil behaviour of listening attentively is slightly higher in the case of low SES group of pupils than in the high SES group of pupils. It is further revealed that in both the groups, listening attentively behaviours show a slight decline in the lessons observed towards the end of the session as compared to those in the beginning of the session. In other words, the students exhibited comparatively higher incidence of listening attentively behaviour in the beginning of the session. The trend in looking fatigued behaviour is just the reverse. The incidence of this behaviour is higher in the case of high SES group in the beginning of the session lesson but the situation is reversed in the end of the session lesson. Looking distracted behaviours follow the same trend. Both the groups exhibit practically equal disruptive behaviours in the beginning of the session but these behaviours decline towards the end of the session. The decline, however, is high in the low SES groups than their counterparts in the high SES group. None of the differences are, however, significant. The null hypothesis Ho_{24}, therefore is rejected.

Volunteer Response/Ideas

The Table reveals that the high SES group of pupils exhibit higher incidence of volunteering response than the low SES group of pupils in both the sets of observation. Further, the incidence of these behaviours, declines slightly in both the groups in the end of the session observation. The difference is significant at .05 level at the end of session. Null hypothesis Ho_{25} (a) is, therefore, rejected. The same trend can be observed in the case of pupils volunteer ideas except that in the high SES group the incidence of this behaviour increases in the end of the session observation. Non responding behaviours have negligibly low incidence in the beginning of the session but it is higher in the case of high SES group than in the low SES group. In the end

of the session observations, the non-responding behaviour of the pupils is completely absent. Null hypotheses Ho_{25} (b) and (c), therefore, cannot be rejected as the differences are not significant.

Seatwork

The seatwork involve reading the book attentively and copying from the blackboard. Evading seatwork and pretending to read the book are negative behaviours. It can be seen in the Table that a little over 31 percent of the behaviours are covered in this category. The predominant behaviours cover writing during the seatwork followed by writing from the blackboard. Reading of the book is divided into two specific categories, namely, reading the book attentively and pretending to read the book. The pupil in high SES group exhibit higher incidence of pretending to read the book than reading the book attentively in the beginning of the session. However, the situation is reversed towards the end of the session. In the case of low SES group the incidence of pretending to read the book is lower in both sets of observations.

If both the groups are compared the high SES group shows slightly higher incidence of reading the book attentively than their counterpart in the low SES group. However, in the end of the session, the low SES group is higher on pretending to read the book than its counterpart in the high SES group. In the case of seatwork involving writing, the low SES group of pupils exhibit higher incidence than pupils in high SES group. The situation is reversed in the end of the session where the high SES group is involved in written seatwork more than the low SES group. Taking notes from the blackboard is also higher in the highSES group than pupils in low SES group. In both the cases there is a decline in taking notes from the blackboard towards the end of the session as compared to in the beginning of the session. In the beginning of the session the tendency to evade seatwork is higher in high SES group of pupils than in low SES group. However, the tendency to evade seatwork disappears completely towards the end of the session. Null hypothesis Ho_{26}, therefore, cannot be rejected.

Solicits Teacher Help

This area covers five pupil classroom learning behaviours wherein he reaches for some help. He solicits teacher help for removing difficulties, to complete seatwork for clarifying doubts, management of disruptive behaviour of a peer who interferes with his learning effort and waiting for the teacher help to materialise. The pupils in high SES group reaches the teacher for removing difficulties more often than pupils in low SES group do. The tendency in both the groups indicates a slight increase in this behaviour towards the end of the session. The difference is nearing significance of .05 level in the beginning of session observation. The tendency to seek teachers' help to complete seatwork is nil in the case of high and low SES group in the beginning of the session. However, towards the end of the session, there is an evidence of such help, though it is very low. The difference is significant at .05 level at the end of the session rejects the null hypothesis Ho_{27} (b). There are very few behaviours relating to clarifying doubts by pupils from, the teacher. The incidence of soliciting pupil help for management of disruptive behaviour of the peers is also quite low, it is rather absent in the low SES group in the beginning. There is a tendency of occurence of such behaviours, which is practically eliminated towards the end of the session. The wait for teacher help is practically absent from both groups which may be due to the low incidence of help soliciting pupil behaviours. If such few behaviours occur the teacher help might be forthcoming instantaneously. Null hypotheses Ho_{27} (a), (c), (d) and (e), therefore, cannot be rejected as the differences are not significant.

Peer Interaction

This area covers four specific behaviours, namely, discussing a point, giving help, accepting help and responding to peer questions. Peer discussion on points in the classroom is higher in the high SES group in the beginning of the session but towards the end of the session, it declines in this group and

increases slightly in the low SES group. The difference is, however, nearing significance of .05 level in the beginning of the session observation. Giving help to peers is higher in the low SES group in the beginning of the session than in high SES group but it practically disappears in both the groups towards the end of the session. The other two behaviours, namely, accepting peer help and responding to peer questions are negligibly small. The incidence of these behaviours is practically absent. So null hypothesis Ho_{28} cannot be rejected.

Helping the Teacher

It involves two specific behaviours, namely, student helping the teacher in handling material and helping the teacher on the blackboard. The behaviours in the first group are practically absent except a very low incidence in the high SES group in the beginning of the session. It may be due to very limited use of materials by the teacher in the classroom. The pupils from the low SES group show slightly higher mean value than pupils of high SES group. Null hypothesis Ho_{29}, therefore, cannot be rejected.

Managerial activities

The pupils are involved in managerial activities which may be teacher directed or self directed. Teacher directed activity is higher in the case of low SES group of pupils than high SES group. However, in both the cases there is a tendency to increase the incidence of this behaviour. The same trend follows pupil involvement in self directed activities in both the groups. Null hypothesis Ho_{30}, therefore, cannot be rejected.

The high and low SES group of pupils differ in their classroom learning behaviours to a varying degree as there are only two behaviours, namely, volunteers response and solicits teacher help for completing seatwork, significant at .05 level, while other two solicits teacher help for removing difficulties and pupil discussing a point are nearing significance level in the

beginning of the session observation, whereas other mean differences are not significant. The most occuring behaviours are listening attentively occuring about 51 to 59 percent, involved in writing is occuring about 22 to 29 percent and other PCLB occurs very less ranging 7 to zero percent at the two points of observation.

Pupil Out-of-School Achievement Related Efforts

Table 4.2 provides means, SDs, t-values and probability in case of high and low SES pupil out-of-school achievement related efforts (POSARE). These have been collected in terms of various possible activities done by the pupils at home on various days i.e. working day, holiday or a vacation day. The break up of such activities have been recorded in terms of time in minutes per day in case of most of the activities. The means of the time per day so collected have been compared in respect of high and low SES group of pupils.

TABLE 4.2

MEANS, SDs, AND t-VALUES OF HIGH AND LOW SES PUPILS OUT-OF-SCHOOL ACHIEVEMENT RELATED EFFORTS

S. No.	POSARE Variables (Time in minutes per day)	Mean		S.D.		t-value	Probability
		SES(H)	SES(L)	SES(H)	SES(L)		
1.	Total time						
	(a) Working day	285.62	298.75	93.40	91.96	.63	.528
	(b) holiday	283.62	306.87	93.51	108.28	1.06	.295
	(c) vacation day	267.87	276.00	84.63	96.61	.40	.690

2. Library study time

(a) Working day	28.87	34.75	33.00	30.95	.82	.414
(b) holiday	27.00	35.63	30.03	31.95	-.24	.217
(c) vacation day	27.75	30.37	33.38	30.68	-.37	.715

3. Home task time

(a) Working day	85.25	81.37	36.88	38.80	.52	.602
(b) holiday	86.87	86.75	43.90	34.74	-.10	.922
(c) vacation day	77.63	78.75	44.14	44.39	-.11	.910

4. Curricular study time

(a) Working day	115.62	127.50	65.46	66.98	-.80	.425
(b) holiday	107.75	123.62	61.82	65.59	-1.10	.273
(c) vacation day	94.50	96.87	51.43	57.52	-.19	.846

5. Non-curricular study

(a) Working day	32.12	23.50	35.68	25.34	1.26	.210
(b) holiday	36.75	31.50	38.27	33.93	.65	.518
(c) vacation day	40.02	42.50	38.07	42.88	-.27	.786

6. Newspaper and magazine study time

(a) Working day	31.25	33.13	19.07	21.86	-.41	.684

(b) holiday	35.75	31.87	24.67	20.87	.76	.450
(c) vacation day	34.12	29.12	27.27	19.14	.95	.345
7. Help received time	83.25	50.90	41.32	49.09	3.19	.002**
8. Teaching and preparation time	79.62	81.00	51.49	61.76	-.11	.914
9. Co-curricular activity time (yearly in hours)	10.57	11.75	11.75	7.58	.68	.498
10. Hobbies time (hours per week)	4.80	3.90	3.90	2.69	1.32	.192

SES (H) : High Socio-Economic Status
SES (L) : Low Socio-Economic Status
S.D. : Standard Deviation

A perusal of the Table reveals that the first three items give utilization of out-of-school time for achievement related tasks on a working day, on a holiday and on a vacation day. The three types of days have been differentiated because of the variation in time duration available and the mental set of the pupils. The maximum time devoted to achievement related tasks is in the case of high SES on a working day followed by a holiday and then on a vacation day. The minimum time is 267.87 minutes and maximum total time devoted is 285.63 minutes show a range of

17.76 minutes. The corresponding range in the low SES group is 30.87 minutes as the maximum total time is 306.87 minutes and minimum is 276.00 minutes. The higher range in the low SES group of pupils is an indicator of more variation in time devoted to studies on different ways. The maximum amount of the out-of-school time is devoted to such studies on a holiday, followed by working day and then on a vacation day. Both the groups devote minimum on the vacation day. The higher allocation of time by pupils on a vacation day may be due to the size of the home assignment given by the teacher. During vacation days the assignments are limited.

The remaining categories of out-of-school achievement related efforts provide differential distributions of the total time on different days to different sets of activities namely library study time, home task time, curricular study time, non-curricular study time, newspaper and magazine study time, help received time, teaching aid preparation time, co-curricular activity participation time and time devoted on hobbies.

For library study, the time devoted by the pupils in high SES group is almost the same on a working day, holiday and vacation day coming to a little less than 30 minutes. Low SES group of pupils devote more time ranging between 30 and 35.63 minutes per day. High SES group of pupils devote a little more time on home task on a working day than low SES group of pupils, while time devoted on holiday and vacation day by both the groups of pupils is practically the same. Both groups devote a little less than hour and a half per day for this activity. Time devoted to curricular study for the low SES pupils is higher than the high SES group of pupils. It ranges between 77.63 minutes to 85.87 minutes in the case of high SES pupils and 78.75 minutes to 86.75 minutes in the case of low SES pupils. The complimentary non-curricular study time is lower in the case of low SES pupils than their counterparts with high SES on working day and holiday. The situation is, however, reversed on a

vacation day. This supports the curricular study time distribution. The time devoted to newspaper and magazine study on working day is higher in the case of low SES group while on holiday and vacation day, it is higher in the case of high SES group. So far as time devoted on help received for study at home from the parent or the tutor, it is higher in the case of high SES group of pupils than in the case of low SES pupils. The mean difference is significant at .01 level. The time devoted by the two groups for preparation of teaching-aid involvement in co-curricular activity and time devoted on hobbies have slight variation in their mean values.

Table 4.2 on examination infers that help received by pupil by parent or tutor or both computed in minutes per day shows significance level of .01 and this factor predominates high SES group of pupils as their means are higher when compared to those of low SES group. So the null hypothesis Ho_{37} in respect of help received behaviour is rejected. In the case of all other pupil out-of-school achievement related efforts, the null hypotheses Ho_{31} to Ho_{36} and Ho_{38}, Ho_{39} and Ho_{40} cannot be rejected as the difference in means are not significant.

Teacher Behaviour

As pointed out earlier, the major objectives were referred to classroom learning behaviour of pupils. But pupil classroom learning behaviour does not occur in isolation. Through interaction, teacher behaviour provides major stimuli for pupil classroom learning behaviour. To that extent teacher behaviour was also recorded. The interactional teacher behaviour was classified into the five areas, namely, explanation, questioning, helping, supervision, and management. The mean and standard deviation values are presented in Table 4.3.

TABLE 4.3

MEANS AND STANDARD DEVIATION OF TEACHER BEHAVIOUR

S. No.	Variable description	Mean		S.D.	
		BSL	ESL	BSL	ESL
	Explanation				
1.	Teacher explains plan	39.88	45.40	15.85	14.64
2.	Teacher explains need	7.50	3.75	5.36	2.81
3.	Teacher writes on black-board	6.15	3.48	4.50	2.39
4.	Teacher handles material	0.38	0.15	0.68	0.36
	Questioning				
5.	Teacher asks question	8.50	4.43	4.47	3.37
6.	Teacher listens to pupil response	7.21	8.80	4.37	5.39
	Helping				
7.	Providing help to pupils	1.40	1.35	2.08	2.69
8.	Encouraging pupils	0.60	0.08	1.55	2.28
	Supervision				
9.	Supervising seatwork	9.55	17.35	8.50	13.37
10.	Corrective feedback	1.20	0.33	1.45	0.51

Management

11. Management of disruptive behaviour	0.23	0.50	0.46	1.56
12. Gives direction	17.35	14.15	10.75	9.71
13. Interrupted by outsider	0.05	0.23	0.15	0.73

BSL : Beginning Session Lesson
ESL : End Session Lesson
SD : Standard Deviation

Explanation

The mean value of teacher explanation (plan) is higher towards the end of the session than it is in the beginning of the session. While explanation (need) mean is more in the beginning and declines towards the end, the same trend is followed in teacher writing on the blackboard and teacher handling the material mean is quite low which may be due to the limited use of material in the class.

Questioning

The questioning behaviour of the teachers comprises only two categories, the first deals with teacher asking question, while the second refers to listening to pupils responses to questions. The incidence of asking questions mean is higher in the beginning of session lesson than towards end of the session lesson observation. The percentage occurence of the questions is practically the same as reported in Jangira (1981). The incidence of teacher listening to pupil response is slightly higher in the end of the session lesson than in the beginning of the session lesson. The higher percentage of teacher listening pupil

response in relation to muchlower percentage of teacher asking question in end of the session lesson indicates that the questions require longer responses. In the case of the lessons in the beginning of the session, it appears that the questions may have been asked requiring comparatively brief responses.

Helping Pupils

The specific behaviours under this area refer to providing help to the pupils and encouraging them. The incidence of teacher behaviour providing help to pupils and encouraging pupils are higher in the beginning than towards the end of the session.

Management

Classroom management behaviour of the teachers includes the specific behaviours of managing disruptive behaviour and giving directions. Interruption by outsider does not directly constitute management behaviour but this does effect classroom transaction. It has been included in this category for this reason. The teachers have been found to exhibit lower incidence of teacher behaviours during beginning of the session than in the end of the session. The incidence of giving direction is higher in the beginning than in the end of the session. The interruption by outsider showed a tendency of increase in the end of session lesson than in the beginning of the session lesson.

The teacher behaviours have been computed in relation to pupil classroom learning behaviours, which have shown the varying occurence of these at two different occasions. The most occuring teacher behaviour is explanation plan from 39.58 to 45.40 percent of time in the classroom followed by giving directions and supervision of seatwork. The teacher behaviours differ at two occasions that is in the beginning of the session and at the end of the session. The teacher behaviours are the same for two groups of pupils, hence these have not been computed for their t-values.

Pupil Achievement

Pupil achievement in science theory, practical and combined constitute measures of the criterion variable. Table 4.4 provides means, SDs and t-values and probability in respect of achievement of high and low SES groups of pupils.

TABLE 4.4

MEANS, SDs, t-VALUES AND PROBABILITY OF HIGH AND LOW SES GROUP OF PUPILS

S.	Variable	Means		SDs		t-value	Proba-bility
		SES(H)	SES(L)	SES(H)	SES(L)		
1.	Achievement (Theory)	35.17	36.77	16.20	13.70	.48	.635
2.	Achievement (Practical)	32.17	33.25	8.09	7.32	.37	.714
3.	Achievement (Total)	67.35	70.00	20.13	17.42	.53	.595

SES (H) : High Socio-Economic Status
SES (L) : Low Socio-Economic Status
SD : Standard Deviation

The Table reveals that achievement of low SES group of pupils is slightly higher than that of the high SES group. The difference of means, that is, its t-values are not significant inferres that the null hypothesis Ho_{23} is rejected.

Context Variables

The context variables include pupil characteristics. The present study is confined only to the context variables like pupil intelligence and socio-economic status. Table 4.5 provides means and SDs of pupils with high and low SES group of pupils.

TABLE 4.5

MEANS, STANDARD DEVIATIONS AND t-VALUES OF PUPILS CONTEXT VARIABLES

S.	Variable	Means		S.D.		t-value	Probability
		High SES	Low SES	High SES	Low SES		
1.	Intelligence	97.73	93.40	15.77	24.55	.94	.351
2.	Socio-Economic Status	58.30	27.35	7.53	6.34	19.96	.004**

SES : Socio-Economic Status
SD : Standard Deviation

It will be seen that high SES group of pupils has a higher mean IQ score than that of the low SES pupils. The t-value is not significant so it refers that there is no difference in intelligence of high and low SES groups of pupils. The SES mean scores of the two groups is 58.30 and 27.35 respectively. t-value is significant at .01 level. The difference are conspicuous because they were so planned. In other words pupils with extremely high and low SES scores in the classroom were selected for the study with the help of the tool.

5

The Message

Introduction

Future of a nation, a society, a group, or an individual depends upon progressiveness for which education acts as a major instrument. The efforts to improve the rate of progress will depend directly on the quality of education. The education is provided by schools in the classroom supplemented by the home environment stimulating pupil achievement related activities. The area of teaching invited a number of researches in the last three decades but the findings so far have not been able to provide appropriate answers to the quaries raised by the professionals. What do pupils do in the classrooms? What are the instructional resources available and how do they make use of them? Yet another related question is whether there are some ways which can be suggested to the teachers to exhibit teacher behaviour pattern to generate the desired level learning in pupils? Can we provide guidelines to teachers about the effective classroom learning behaviour of pupils so that they can encourage pupils to develop such behaviours? The answer to these questions is to be based on the answers to other related questions. For example, do pupils differ in their classroom learning behaviours? If so, do they differ in their achievement? Based on the questions posed above, a new generation research on teaching involving several new variables have emerged. It

provides directions along which further efforts should be channeled for quality improvement in education. The variables are being conceptualised and researched. In India, the work on classroom learning behaviour of pupils is yet in its embryonic stage. The present study is directed to bridge the research gap in this area.

In the present study the classroom learning behaviour of high and low SES pupils that include both verbal and nonverbal behaviours in classroom transactions in the process of learning from teacher instruction has been analysed and their relationship with pupil achievement has been investigated. The pupil out-of-school achievement related efforts in relation to their achievement have also been covered. The teacher behaviour and pupil achievement have been considered for deriving concomitant results. Pupil achievement comprises achievement in chemistry theory, practicals and the two taken together.

Message for Future Research

A perusal of the study makes it evident that the investigation attempted to break new ground in research on teaching. The Focus on pupil classroom learning behaviour and pupil out-of-school achievement related efforts constitute new dimensions of research on teaching. The study has been among the very few conducted in this area in the country. It may be recalled that the investigation was designed as correlational study in order to generate hypotheses for further research. This section purports to provide implication for future research in this area. It may be premature to work out implications for practice at this state. However, this study in conjunction with further research will be able to provide guidelines for teachers as well as teacher educators. This section, therefore, is confined to implications of the study for research only.

The preceding section has revealed several significant correlations. For example, listening attentively in the classroom is positively related to pupil achievment. The relationship gets further support from negative correlations of pupil achievement with factors interfering with pupil attention (looking fatigued, looking distracted), pupil volunteering response, reaching teacher for removing difficulties, reaching teacher for completing seatwork giving help to peers, doing teacher directed activities are other pupil behaviours found to be associated with their achievement. Similarly the time devoted by pupils on home task, reading newspaper and magazine, receiving help from parent or tutor at home and time engaged in co-curricular activities outside school hours have been found to be positively correlated with their achievements. Same is the case with relationship between teacher explanation (plan), encouraging pupils in the classroom process, providing corrective feedback, supervising seatwork and management of disruptive behaviour. These significant correlations need to be used for formulating hypotheses and generating experimental research for studying cause-effect relationships.

The study yielded differences between the mean achievement score of pupils belonging to high and low SES pupils which are not significant. It may be due to the fact that only the Government institutions were selected for the study. Pupils with high and low SES were selected. The difference in the socio-economic status of the two groups were also significant (Table 4.5, P-126). But this categorisation was within the narrow range of SES of pupils studying in Government schools. What would have been the results if pupils with extreme high and low SES scores were selected for the study? The question can be answered only by further research with the sample from extreme SES groups.

Although it is difficult to control institutional characteristics to select such a sample, but research of this type would be quite significant.

The present study used examination marks of pupils as the criterion measure of achievement in science. The final examination marks constitute relatively distant pupil outcome criteria. It will be interesting to study immediate pupil achievement using criterion reference test for getting a measure of pupil achievement in the lessons which are observed for recording pupil classroom learning behaviour. In the experimental study proposed above an attempt should be made to design it in a way that pupil achievement can be studied as direct outcome of pupil classroom learning behaviour.

Out-of-school achievement related activities of pupil have yielded several meaningful relationships. It has been measured in terms of time spent in different activities. In addition to the criteria it will be worthwhile to consider micro-analysis of the way in which pupils are engaged in different activities. The types of activities persued by these children would provide further explanation of the results.

The present study has used low inference variables in terms of PCLB and teacher classroom behaviour. The unit of analysis used in the study has also been teacher and pupil behaviour. The sequenced configuration of their behaviour may be able to provide more meaningful variables for research and practice relating to teaching. Even the data of the present study can be re-analysed for the identifying patterns of sequenced teacher and pupil behaviours following analytic unit for post-doctoral work. These types of studies may be encouraged for enriching research support for teaching.

The present study was confined to one grade and one subject only due to the limitation of time and resources. There is, however, a need to carry out such study in different grades and in different subjects. Intergrade, intersubject and even intrasubject variations need to be studied for developing the scientific basis of the art of teaching.

The study used only cognitive pupil outcome as the criterion variable in terms of achievement in science. The Pupil Classroom Learning Behaviour and their out-of-school achievement related activities do influence their affective outcomes. It is, therefore, desirable to include affective outcome variables in future studies alongwith cognitive outcomes. Even outcomes in psychomotor domain can also be studied.

Conclusion

The Pupil Classroom Learning Behaviour and their outcome has emerged as an important area of research in teaching. The present study has made a modest contribution by initiating research in this area. It has provided results which can be utilised for formulating hypotheses and generating further studies in this area. It will provide practical guidelines for improving effectiveness of teaching when backed up by more research. The study is concluded with the hope that future research would build upon this study to enrich knowledge about Pupil Classroom Learning Behaviour and variables emerging from their out-of-school learning efforts.

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